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MEDICINE

A MONTHLY RECORD OF THE WORLD'S PROGRESS IN MEDICINE AND SURGERY

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EDITORIAL.

MILK IN SOLID FORM.

Various forms of milk products are on the market, from the condensed variety to those which are more or less solid. As a rule the complete desiccation has required the addition of some other substance, such as cane- or milk-sugar, and in the older condensed product sugar was essential to its keeping properties. A recent issue of the *Scientific American* contains an account of a new method of desiccating milk by which it is almost instantaneously reduced to the solid form. The apparatus described consists of two revolving cylinders containing superheated steam under a pressure of 40 pounds. The two cylinders are brought accurately in apposition and the milk is fed between them, so that it is instantly dried in the form of a thin sheet, which is removed from the drum by a scraper. As it comes from the machine it is in the form of a damp shaving, which is readily dried and pulverized. The advantage of this method over other processes of desiccating milk is said to be that it gives a uniform product, and it does not contain lumps, which in some other processes are found to decompose and have a cheesy odor. It is claimed by those who have used the process that the milk can be restored to its former appearance and taste by the addition of water. This claim would not seem to be substantiated, considering that no matter how rapid the process may be the milk is really exposed to a very high temperature. This certainly must alter the coagulable proteids, and so it is doubtful if it can be restored to the original condition of milk simply by the addition of water. Even if this cannot be done it is probable that in this way an exceedingly valuable food product may be prepared which will be useful in the feeding of children and invalids.

MARK TWAIN'S RULES OF HEALTH.

At the occasion of his seventieth birthday the great American humorist took occasion to call attention to the methods by which he has secured the psalmist's three score and ten years. He has been regular about going to bed and getting up, making it a rule to go to bed when there wasn't anybody left to sit up with, and to get up when he had to. He had been consistently regular in his early years in taking food that frequently disagreed with him. In regard to smoking, the only restriction he has imposed is to smoke one cigar at a time. He is not quite sure when this habit was con-

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Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

tracted, but some time prior to his eleventh year it was resorted to secretly, and since that time he has been an open and avowed smoker. In reference to drinking, he prefers to remain dry excepting when others are about and there is drinking going on; then he likes to help. He does not recommend this practice to others, as he points out that dryness does not hurt him but might easily injure other constitutions. He says: "I have never taken any exercise except sleeping and resting, and I never intend to take any. Exercise is loathsome, and it cannot be of any benefit when you are tired; I was always tired. I have lived a severely moral life, but it would be a mistake for other people to try it or for me to recommend it; very few would succeed. Morals are an acquirement like music, like a foreign language, piety, poker, or paralysis. No man is born with them; I wasn't myself, I started poor."

We are not quite sure that the remarks of Twain are very illuminating or that they conduce very much to longevity, but they are up to the average level of those who have attained to advanced years, and who undertake to enlighten others on how they did it.

THE ECONOMIC VALUE OF MILK INSPECTION.

The Bulletin of Chicago's Health Department refers to certain pertinent facts relative to the milk inspection of Chicago. Owing to recent changes in the city hall the department temporarily lost its laboratory for milk inspection, and examinations in this department became relatively less frequent. The dairy interests were not slow to take advantage of the situation, and there was a prompt increase in the amount of watered milk, the watered samples increasing from about two to above six per cent. There is brought into the city daily over one million quarts of milk and some fifty thousand quarts of cream. The percentage of increase in water is fairly well known, so that a reasonably accurate estimate can be made of the consumers' losses. A careful estimate showed that consumers paid $3000 a day more for the extra amount of water in their milk during the month of November than they did in October. The total for a month would be over $90,000, a sum sufficient to equip and maintain several laboratories. This shows the economic value of milk inspection; it saves to the people many times its cost.

COLD STORAGE PRODUCTS.

The problem of feeding a large urban population is complicated and has led to numerous modifications in the storage of food supplies. Among the most modern is the method of cold storage, by which the flesh of animals and to a considerable extent vegetables are preserved at a suitable temperature in a manner which is supposed to prevent decomposition. Eggs may be preserved in this way for indefinite periods, but it is apparent to all users of eggs that during the period of cold storage they undergo some molecular change. The flavor is somewhat altered, and the consistence of the egg when cooked is different. It is probable that this change as far as the egg is concerned does not affect its food value, but it is certainly not as appetizing as a strictly fresh egg. Meats are said to improve by a prolonged detention in cold storage; at least they become more tender, and hence require less cooking to prepare them for the table. What effect cold storage has upon meat, whether it impairs its food value, or whether products are produced by prolonged cold storage which are deleterious, are problems which have not yet been studied. In relation to poultry and fish there can be no two opinions as to the deleterious effect of prolonged detention in cold storage. Especially is this true when the poultry is not drawn. In such cases the intestinal

juices gradually permeate the muscles, and as soon as such fowls are exposed to ordinary temperatures decomposition is exceedingly rapid.

The whole question of the care of food products needs a thorough overhauling and careful study. As yet the investigations of our public health authorities relate solely to the condemnation of food products that have already become offensive to the eye and to the nose. Studies of decomposition in milk have shown that this fluid may be apparently normal and yet contain poisons of a virulent sort. The same may be true of cold storage products, notwithstanding that they may be devoid of offense to the eye or the nose. A valuable field of investigation would be a study of the possible alteration in food value by these modern methods of preservation.

THE FOOT IN TABES.

An interesting study by Schwab and Allison is found in the December 16 issue of the *Journal of the American Medical Association,* on the mechanical relations of the foot in tabes. This is a subject that has received practically no attention, excepting descriptions of hopelessly deformed joints for the purpose of illustrating the trophic disturbances in tabes. It has been assumed that difficulties in locomotion in ataxics were due to interruption of the centripetal conducting paths in the cord, and no study has been made of the instrument of locomotion—the foot. Schwab and Allison (a neurologist and an orthopedist) have studied fifteen cases of tabes in reference to changes in the feet which impair locomotion. They were ordinary cases, not bedridden, and cases which were free from gross disorganization of the joints. The tabetic, who is ataxic, has a pronated foot with a tendency to roll inward. This is in part due to position of the foot in walking: turning the toes outward to broaden the base, and to the relaxation of the muscular supports due to the hypotonia. The amount of pronation bears some relation to the degree of the ataxia.

Relief in walking has been afforded by using a shoe that would in a measure overcome the pronation. At first the Whitman plate was used, which for non-tabetic cases is sufficient, the patient being reminded at every step by pressure on the scaphoid bone that the foot must be inverted. This is not sufficient for the tabetic owing to the sensory anesthesia. The best results were obtained by lengthening the heel from one-half to one inch and using a cork insole, by which the inner side of the foot was raised. Three transverse cleats on the sole gave additional support and greater security to the gait.

The most marked advance in the treatment of tabes in recent years was the systematic re-education of the ataxic by Frankel. It is apparent how a method such as is here described that will improve the security of the gait will be a great boon to these sufferers. The gait is the most distinctive sign of their infirmity.

ROENTGEN NOMENCLATURE.

The enormous multiplication of terms dealing with the *x*-ray and its various applications is already proving a hindrance to the study of the subject. The following uniform nomenclature has been recommended by the recent Roentgen Congress held in Berlin:

Roentgenology: The science of the Roentgen rays.

Roentgenoscopy: Radioscopy.

Roentgenography: Roentgen photography.

Roentgenogram: Skiagram. (*a*) Roentgen negative; (*b*) Roentgen positive; (*c*) Roentgen diapositive.

Ortho-Roentgenography.

Roentgentherapy: Roentgen treatment.

Roentgenize: To treat by means of the Roentgen rays.

ORIGINAL ARTICLES.

HEPATIC THERAPEUTICS.

BY HUBERT RICHARDSON, M.D.,

Clinical Lecturer on Neurology and Psychiatry; Lecturer on Physiologic Chemistry at the University of Maryland; Pathologist to the Maryland Asylum and Training School for Feeble-minded Children; Late Pathologist to Mount Hope Retreat.

The treatment of the liver has to be considered from two standpoints, medicinal and hygienic. The medicinal treatment of the liver is but little understood, being confined to the use of a few drugs, the effects of which are irregular owing to our being unable to distinguish the different pathologic conditions. Excluding the surgical diseases of the organ and those of the biliary passages, the pathology of hepatic disease can be summed up under the heading of cirrhosis, a condition which is always the result of an infection or toxemia. The hepatic cirrhoses are divided into two classes—those in which the lesions are simply a connective tissue growth, a simple sclerosis, and those in which the sclerotic changes are accompanied by lesions of the hepatic cell. Toxic cirrhosis may be due to an autointoxication or to a heterointoxication, the former being associated with digestive disturbance, gout, diabetes, etc., the latter exemplified by alcohol, lead, or phosphorus poisoning; the one associated with the cirrhosis of Laennec and annular cirrhosis, the other associated with hypertrophy, demonstrating the resistance and effort at compensation of the sick organ. Infectious diseases, as malaria, syphilis, etc., produce cirrhosis, usually affecting the biliary system, Hanot's hypertrophic cirrhosis being typical of this form. There are cirrhoses due to mechanical causes, as those associated with cardiac disease.

Cirrhoses in which there is simply a growth of connective tissue do not long continue without affecting the liver cells, producing fatty, amyloid, or pigmentary degeneration, causing more or less grave derangement of cell function. During the progress of the disease they cause three modifications of function—exaggeration, diminution, and perversion. As a rule the exaggeration and perversion of function are transitory conditions; they are represented by the hypertrophic toxic cirrhosis, the result of the resistance of the organ to the disease, but the overtaxed cells gradually succumb to the hyperfunction entailed and hepatic insufficiency follows; the nature of the perversion or exaggeration controlling the precise form of insufficiency which results. Hepatic insufficiency may exist without demonstrable cell alteration; more often it is symptomatic of distinct lesions, but it means that the organ is unable to fulfil its normal functions. The functions of the liver may be divided into four groups:

1. Circulatory. The liver destroys the erythrocytes, playing the part of a regulator to the composition of the blood. It holds iron in reserve, obtaining it from the destroyed cells and from the food.

2. Glycogenic. The liver forms and holds in reserve the glycogen, controlling the carbohydrate nutrition; it also controls the proteid and fatty metabolic processes.

3. Antitoxic function. The liver forms urea from ammonia, forms and destroys uric acid, forms the sulphoconjugations of the phenols; it arrests and modifies toxic substances, usually

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by oxidation, being the organ in which the most active oxidative processes occur.

4. Biliary function. The liver forms a secretion—the bile, which may be considered both an excretion and secretion, as it contains the bile salts glycocholate and taurocholate of soda, which are necessary for intestinal digestion, while the bilirubin and other substances are excreted into the intestine for elimination.

Of these four groups of functions it is evident that one or more may be deficient, and to treat any case it is of importance to decide which function is insufficient. Physical examination gives little or no help in the differentiation. Antemortem examination of the bile is impossible except in cases of fistula, and it is to the urine and feces that we must look for the data necessary for a diagnosis. The following are the points to be examined to determine the nature of the hepatic insufficiency: alimentary glycosuria, hypoazoturia, ammonuria, hyperazoturia, urobilinuria, indicanuria, intermittent elimination of methylene blue, the oxidation of sulphur, the conjugate sulphates, uroerythrin, and hippuric acid. The feces should be examined for fat, bile pigments, and undigested proteid.

Alimentary glycosuria, first studied by Claude Bernard, followed by Robineau, Roger, Hanot, Gilbert, Reynaud, and others, as a pathologic condition, is usually tested by the administration of 200 grammes glucose or levulose syrup. Should the urine contain sugar, giving Fehling's reaction, the glycogenic function of the liver is affected. The value of this test as evidence of general hepatic insufficiency is disputed: Roger found the test positive only in 6 out of 10 cases of insufficiency, Surmont in 10 out of 15, Bierens and Haan in 18 out of 29, Reynaud and Olmer in 11 out of 30, Maury in 16 out of 53 cases. In atrophic cirrhosis Valmont found the test positive in 1 out of 7 cases, Mehring in 2 out of 9, Frerichs in 2 out of 19 cases of phosphorus poisoning. These figures show that in hepatic insufficiency the glycogenic function is impaired in about 40 per cent of the cases, and in atrophic cirrhosis in about 16 per cent.

The test for urobilin in the urine is easy and should never be neglected. The filtered urine is heated with a little ammonia and a drop or two of zinc chloride added; if urobilin be present a green fluorescent coloration appears. A more complicated test is to saturate the urine with ammonium sulphate and dissolve the precipitate in alcohol; a reddish-brown colored solution is obtained, which can be tested with ammonia and zinc chloride solutions or with the spectroscope. The latter can also be used with the fresh urine, but is too delicate, as small quantities are detected which are not pathologic. The question as to whether urobilin is formed in the intestine or in the liver is still a matter of dispute. Hayem says that urobilin is the pigment of the diseased liver, and states emphatically that it is never found in the urine except in cases of hepatic insufficiency. Vires considers that clinically the presence of urobilin in the urine is definite proof of hepatic disease, and that it is of secondary importance where it is formed; he considers urobilin the pathologic and bilirubin the normal excretion of the liver.

Indican is found in small quantities in normal urine; in excess it is associated with hypochlorhydria, sometimes with hyperchlorhydria, with the presence of pus in any part of the body, in Asiatic cholera, cancer, typhus, and constipation; it is probably of intestinal origin, but the liver takes an active part in its formation. It is present in excess in most hepatic diseases, but is not an absolute sign of hepatic insufficiency; it should be regarded as one of the toxins which produce the disease.

The elimination of methylene blue is a test which is difficult to carry out, at least in private practice; it consists in injecting 0.05

gramme of the methylene blue in 1/20 per cent solution and watching its elimination in the urine. Under normal conditions the coloration of the urine is regular, increasing to a maximum, and then diminishing. In patients suffering from hepatic disease the coloration is irregular, alternating in depth of color. In severe cases the coloration may be intermittent.

Hypoazoturia is the result of the failure of the liver to form urea from the carbonate and the carbamate of ammonia, consequently the proportion of the total nitrogen eliminated as urea is reduced and the ammonia increased. The methods for the quantitative estimation of urea and ammonia are complicated; Follins's method is best, but tedious for general practice. Under normal conditions the amount of nitrogen eliminated as urea should be about 82 to 95 per cent of the total nitrogen, in cirrhosis the percentage of urea nitrogen may be reduced to 73 or 79 per cent, in jaundice from 50 to 70 per cent, and in yellow atrophy from 40 to 60 per cent. The urea function of the liver can also be tested by injecting from 5 to 6 grammes of ammonium acetate into the buttocks; the ammonia is converted into urea under normal conditions, but is eliminated as ammonia if the hepatic function is impaired. A certain proportion of the sulphur is eliminated not fully oxidized to sulphate; if this proportion is increased it is evidence of imperfect hepatic function, the liver being the organ in which the most active oxidizing processes of the body are carried out. The proportion of neutral sulphur to total sulphur eliminated under normal conditions is from 10 to 12 per cent; in hepatic insufficiency it may be increased to 40 per cent. This is considered by many to be one of the most important of all tests for diagnosis.

Roger and Garnier introduced a solution of dihydrogen sulphide into the rectum; under normal conditions the gas is returned by the liver, but in hepatic insufficiency it is eliminated by the lungs, the expired air blackening paper wet with lead acetate solution.

Uroerythrin is the bright pink color so often seen in the brick-dust sediments of urine; it occurs in acute diseases of the respiratory system, in acute rheumatism, and in gout. It is probably only in the latter case that it can be considered as evidence of impaired hepatic function.

A diminution of hippuric acid is said to be a symptom of hepatic deficiency, but as only 0.3 to 0.4 gramme of hippuric acid is eliminated normally in the twenty-four hours it cannot be a test of great value. The presence of small quantities of bile pigment in the urine, which can be tested for very easily by means of Rosin's test, is almost positive proof of a congestion of bile within the liver. The examination of the feces is not as often carried out as it might be; absence of bile or disease of the biliary duct causes the acholic stool, and also increases the amount of fat. Especially in infancy and childhood is the pale stool of diagnostic import, it being positive evidence of an inefficient liver.

The toxicity of the urine has been demonstrated by Bouchard and his pupils. As the liver is the guardian of the body against intoxication, hypertoxicity of the urine may be considered as a sign of impaired hepatic function, but the methods at our disposal for testing the toxicity of the urine are unreliable.

There is a condition of hyperazoturia in which the elimination of nitrogen by the urine is enormously increased—not those conditions of hypercritical elimination which occasionally occur owing to some retention, but conditions in which the daily average elimination of nitrogen reaches 15 to 20 grammes or even 25 grammes. In these cases the percentage of urea nitrogen may be normal or even above normal. Cases are on record in which the percentage of urea nitrogen was as high as 98. The neutral sulphur is also diminished to less

than 10 per cent of the total sulphur. In these cases there is probably a hypersecretion of bile, but this is difficult to prove. On physical examination the liver is usually large, hard, and tense. This condition occurs in gross feeders, the liver being stimulated to overexertion, necessarily followed by cell fatigue, with consequent hepatic insufficiency and atrophic cirrhosis.

In the treatment of hepatic insufficiency it has to be remembered that any one of the functions may be insufficient, and therefore it is of importance that they should be differentiated by the foregoing tests, which will show the condition of the glycogenic, the biliary, the urogenic, the antitoxic, and oxidative processes.

There are a certain number of drugs which are used in hepatic disease somewhat empirically, no pharmacodynamic study having been made of their action excepting in cases of natural or artificial biliary fistula.

Opotherapy of the liver has not so far received much attention. Carnot, Gilbert, and Danis claim to have had good results from the use of liver extracts in atrophic cirrhosis, they having observed an increase in the biliary, urogenic, glycogenic, and probably also in the antitoxic functions. Spillman and Demange found that the albumin and urobilin disappeared from the urine. Carnot and Gilbert macerated 150 grammes of fresh pulped pig's liver in 250 cubic centimeters of warm water for twenty-four hours, and administered by the rectum with results. Gaillard and Crequy administered 150 grammes of pulped liver by the mouth, which gave good results, the active principle apparently not being destroyed by the gastric juice; but it was too nauseous for most patients. There are preparations of powdered liver on the market, but they often produce stomach trouble.

Robin has studied the action of drugs in the treatment of hypertrophic cirrhosis in its early stages. Opium in small doses diminishes the glandular and digestive secretions, and is indicated in cases in which a hyperactivity of the stomach exists. Belladonna inhibits the functions of the liver, according to Riegal, Pawlow, and Haidenhain. Arsenic in small doses has a sedative effect upon the action of the liver, especially in the glycogenic function, but its use for any length of time is contraindicated owing to its tendency to produce fatty degeneration. Mercury in small doses is a hepatic sedative; it does not increase the formation of bile, but stimulates Auerbach's plexus. Antipyrin and the bromides are also hepatic sedatives, and are especially indicated when the urea elimination amounts to 0.5 gramme per kilogramme of body weight. They should be administered in about 10-grain doses before meals, with a little sodium bicarbonate to prevent irritation of the stomach, and should be discontinued as soon as the urea elimination has reached normal. Sulphate of copper and lead acetate are also useful in hepatic hyperactivity. Potassium iodide in doses of 5 to 10 grains per diem is valuable, but the doses must be small as the stomach in these cases is susceptible to its disturbing action.

Hepatic stimulants are more numerous and a little better known—benzoate of soda, salicylate of soda, peumus boldus, sodium phosphate, aloes, jaborandi, podophyllin, and gamboge. Potassium iodide acts indirectly by dilating the blood-vessels and increasing the circulation. Benzoate of soda stimulates all glandular secretions, as also does sodium salicylate, the latter increasing the quantity of bile according to some observers. Peumus boldus is given as an infusion; its principal action is diuretic, but it is also used to stimulate the liver. The action of sodium phosphate upon the liver is affirmed by Rutherford, but denied by Prevost and Binet, Baldi, and Stadelman. Aloes in small doses is a hepatic stimulant, as is also podophyllin. Jaborandi in

small doses is said to stimulate the liver, as it does all other glands; in doses of 1 to 2 grains of the powdered leaves it acts upon the liver and does not provoke diaphoresis and salivation. Sodium glycocholate mass in doses of 15 grains per diem stimulates the liver cells, increasing the flow of bile, thereby removing accumulated waste products, especially bilirubin. In cases with the icteroid coloration of the skin it will clear up the complexion in a few weeks. Especially is it indicated in hepatic colic; many cases are on record where its continued use has prevented the attacks of colic permanently.

The diet in diseases of the liver is of great importance, the guiding principle being to obtain the maximum amount of nutrition with the minimum amount of physiologic work, thereby giving rest to the organ. Proteids are necessary for proper nutrition, but in much smaller quantities than generally taken. Chittenden has shown that nitrogen equilibrium can be maintained in health with an intake of about 6.0 grammes of nitrogen per day. The products of proteid metabolism—urea, ammonia, uric acid, creatinin, etc.—are more or less toxic and entail considerable physiologic activity on the part of the liver as well as upon the kidneys in their elimination. Fats are for the most part absorbed by the lymphatics, only a small quantity entering the liver by way of the portal vein; except in the suppression of the biliary secretion the easily digested fats, such as cream, butter, and the vegetable oils, are well borne in moderate quantities. The carbohydrates give but little work to the liver, their end products being principally carbon dioxide and water, both of which are easily eliminated.

The diet in hepatic insufficiency and hyperactivity should be moderate in quantity with a minimum of proteid, say about 6 grammes of nitrogen per day, with some little fat administered in the form of cream, fresh butter, or olive oil, and sufficient carbohydrate to bring the total diet to about 10 calories per kilogramme of body weight. The meat should be well cooked, preferably red meat, white meats containing more nuclein; gelatinous dishes, as calves' head and feet, etc., are to be avoided. Boiled fish, avoiding those containing much fat, are allowed, but shell-fish are debarred. One or at the most two eggs a day may be given, except in gall-stone cases, when the cholesterin contained in the yolk may cause increased elimination by the bile. This is, however, very doubtful; experiments seem to prove that cholesterin is not absorbed from the intestine as such. Milk, the diet usually prescribed, is not satisfactory and should never be given except with desserts. Fresh cheese may be given and is sometimes well borne, but only in small quantities. Of vegetables, peas, beans, scorzonera, salsify, and salads are the best; spinach and tomatoes contain too much oxalic acid. Vegetable diet increases the alkalinity of the plasma and often relieves the constipation, producing bulky stools. Vegetables containing sugar are only tolerated in small quantities, with the exception of Irish potatoes, which should be well boiled and mashed with butter. Toasted bread may be given, but pastry is forbidden; ripe or cooked fruits may be given sparingly. Water or very weak tea are the best drinks; the water should preferably be distilled, in which antisclerosis tablets (four to the pint) have been dissolved, this assisting in the elimination of the waste products. The total fluid taken in the twenty-four hours should be at least 1500 cubic centimeters. In some cases all the meat should be boiled so as to dissolve out the extractives; no soups or broths should be taken. Probably more than anything else the reduction in the quantity of the food is the greatest therapeutic agent, most patients being or having been great meat eaters.

B. J. C.

The following prescription is of value in atrophic cirrhosis: Strychnine sulphate gr. 1/60, pulv. foliæ jaborandi gr. 1, sod. glycocholate mass gr. 5; to make one capsule, t. i. d. Nitrohydrochloric acid is often beneficial. In hypertrophic cirrhosis acetate of potash and nitrate of potash are of value in one- or two-grain doses. In hepatic colic sodium glycocholate mass in five-grain doses rarely fails to prevent a second attack if taken continuously.

THE ECONOMIC ASPECT OF THE MODERN TREATMENT OF TUBERCULOSIS.[1]

BY J. W. PETTIT, M.D., OTTAWA, ILL.

The successful application of a therapeutic principle depends quite as much upon correct methods as upon the correctness of the principle itself. We have passed through the period of skepticism with regard to the modern treatment of tuberculosis and entered upon an era of enthusiasm and activity. All that is now needed is to give our activities proper direction. There is a prevailing impression that because the treatment consists of the use of such commonplace and familiar agencies as fresh air, nutritious food, and rest or exercise that the methods by which these are applied are a matter of comparative indifference and are easy of application. This has led on the one hand to an unsuccessful attempt to carry out the treatment by methods so crude and imperfect that they would only be accepted by the exceptional patient, and on the other by such lavish expenditure as to bring the treatment within the reach of only a few. The treatment is neither simple nor easy, and of necessity relatively expensive. This makes it necessary to take cognizance of the economic aspect of the question.

It has been my privilege during the past year and a half to visit many of the leading sanatoria in this country. The most casual observer cannot fail to appreciate the fact that any attempt to carry out the treatment according to the standards set by the institutions to which we naturally look for guidance must fail because of the enormous expense attending their construction and maintenance. Much to my surprise I found that four of the leading institutions have cost approximately one million and a quarter of dollars and accommodate about five hundred patients or less. This is a per capita cost for equipment alone of approximately $2750, which is expended for housing a class of patients who should not be permitted to live in a house except of the simplest construction, and certainly should not sleep between massive walls no matter how constructed. Upon inquiry I found that this irrational method of procedure grew out of the fact that the medical men who are supposed to direct and control their construction and management have practically nothing to say, and that the physicians in charge are quite as much opposed to this extravagant and unscientific method as those who are in a more independent position to criticize. These institutions are for the most part simply an expression of the vanity of the rich, and should not be accepted as models for our imitation. This is extremely unfortunate, and especially just at the present time, when the demand for these institutions is so great that there is danger of the whole system being broken down by unnecessary expense. It may be said with some appearance of reason that it is nobody's business if certain rich men desire to give expression to their vanity by building expensive sanatoria, but it certainly does concern the general public when

[1]Read before the Chicago Medical Society, Nov. 29, 1905.

it is attempted to follow their example in the construction of institutions which must be built at public expense, or by numerous private subscriptions. As an illustration of the slavish adherence to the expensive and unscientific method which it is my purpose to condemn, I call attention to an item in a recent number of the *Journal of the American Medical Association* to the effect that the city of New York has decided to build a sanatorium for charity patients costing two millions of dollars which will accommodate only eight hundred patients. Two millions of dollars properly expended should be made to accommodate eight times eight hundred patients, and to the decided advantage of the patients themselves.

While preparing this paper I received the annual report of a semicharitable institution in the East. It represents a total investment of one hundred thousand dollars with accommodations for thirty-five patients, at a per capita cost of $17 per week for maintenance. An earnest plea is made for further donations for buildings to increase the capacity to fifty, with the statement that by so doing they can bring the per capita cost to about $12 per week. In these two illustrations I have not selected exceptional cases. I think they fairly represent the average expenditure now being made in such institutions.

There is no phase of the tuberculosis problem which demands more immediate and careful attention than how we shall expend our money in the care of tuberculous patients, no matter whether at public or private expense.

The modern treatment of tuberculosis is primarily based upon life in the open air. To meet this demand we must make a radical departure from the conventional plan of hospital construction. It was perfectly natural that these sanatoria should at first copy the usual methods of hospital construction, hence has arisen altogether too expensive a type. The great difficulties encountered in carrying out the open-air treatment are so formidable that any method which will cheapen or simplify the treatment should be favorably considered. Providing tuberculous patients with sleeping apartments in substantial buildings is not only unnecessary, but in violation of an essential principle which has for its object supplying the patient with fresh air. The simplest and least expensive method which will protect the patient from the inclemency of the weather and supply him with the largest possible amount of the best possible air is the one which commends itself for scientific and economic reasons. We should proceed upon the principle of the greatest good to the greatest number. If we can make a given sum of money which is now expended in the care of one patient provide for several it is our duty to do so. This can and ought to be done. This is the problem which we have been trying to work out at the Ottawa Tent Colony, and, we believe, with some degree of success.

Theoretically the tuberculous patient should live in the open air all the time. This, however, is not practicable. He must have a warm place in which to eat, dress, undress, bathe, and perform his toilet. This makes it necessary to provide an administration building where he can dine and spend the hours especially set apart for social enjoyment. A bath-house with toilet facilities is of course necessary. At all other times the only protection he needs is from rain, snow, and high winds. A properly constructed tent which can easily be heated for the short time necessary to dress and undress completes the equipment. This can be done at a per capita cost of $300, and provide the patient with accommodations which will be acceptable to any except the most fastidious. Any attempt to provide accommodations for this latter class will fail, because it is necessary for all to give up many of those things pertaining to our present method of living if they are to recover. A calculation based upon the

above data shows that the cost for equipment need not be more than from ten to twenty-five per cent of what is now expended. The difference between the interest on the money invested in these more expensive institutions and the depreciation of their property, and three hundred dollars the sum actually necessary, will cure one or two incipient cases each year. This in addition to providing for from four to ten patients where one is now accommodated.

While there has been much criticism of the lavish expenditure in most of our first-class institutions, I am not aware that any attempt has hitherto been made to determine approximately the amount actually needed. Where a protest has been made the tendency has been to go to the other extreme and provide an equipment so very meager and unattractive that none but the exceptionally courageous patient would accept the accommodations offered. This has been true of many of the tent colonies which have been established, and in some respects is quite as serious a mistake as has been made in the other direction. We must meet the demands of the average patient, and on his own terms. We must not make the treatment so expensive that he cannot afford it, or so cheap that he will not accept it.

Since it has been demonstrated that the tent is practicable in a cold climate it should be used more extensively. It fulfils the conditions most perfectly from a scientific standpoint. The difficulty in keeping patients in the open air is well known. Every temptation placed before them in the way of indoor comforts only adds to the difficulty. As well might we seat a hungry man at a table laden with good food and expect him not to eat as to place a tuberculous patient in a comfortable building and expect him to keep his doors and windows open. A few patients will do it, more will not. The only way to insure patients getting fresh air is to place them where they can get nothing else. To be consistent we must keep our patients out-of-doors not part of the time, but practically all the time. In no other way can this be done so easily and satisfactorily as in a tent. It is generally conceded that a tent is an ideal method of housing tuberculous patients in a mild climate. Every argument which may be urged in favor of its use in a mild climate applies with equal force to any section of the United States. Precedent, prejudice, misconception, and ignorance must be overcome before the value of the tent in the treatment of tuberculosis will be recognized. No amount of argument will settle this question. A practical demonstration is all that is needed to convince the most skeptical.

The cost of food is the most expensive item in the treatment of tuberculosis. Any attempt to cheapen this feature by cutting down the quantity or cheapening the quality will tend to nullify the treatment just to the extent to which this is done.

The psychical element must be also considered. This makes it necessary to provide certain forms of amusement and recreation, which adds somewhat to the expense. There is another feature in the more expensive institutions which is bad. The morale of too much extravagance is injurious to the future of the patient. For example, take a young man who has never had more to supply his wants than is afforded by a meager salary of ten or fifteen dollars per week. Give him an opportunity to cultivate the extravagant tastes inculcated by a sojourn of several months in a luxurious sanatorium, and then send him back to his former method of living, or what is more likely with his earning capacity greatly diminished, and what is the inevitable result? If he is not demoralized he is a young man of more than ordinary stability of character. This argument is not far-fetched, but based upon facts.

In the location of many of these institutions some one feature—as, for example, a beautiful outlook—has been allowed to dominate the

whole situation. This in many instances has led to their being located far away from centers of population and food supply—in places not easily accessible, even to the extent of being several miles from a railway station. Not infrequently water is difficult to obtain, and only at great expense. These are minor mistakes, but in the aggregate add materially and unnecessarily to the expense. Not infrequently the acceptance of a donated site is an unfortunate investment.

This whole question must be considered from a business standpoint and conducted on business principles. Just in proportion as we depart from business methods in the conduct of these institutions, just to that extent do we impair their usefulness and invite failure.

Any proposition looking to the care of the vast army of consumptives resolves itself in its final analysis into a question of dollars and cents. It is not possible except on the most extravagant scale to provide for even a majority of these sufferers; therefore it is the duty of those most prominently identified with their care not only to devise inexpensive methods, but to firmly oppose the present tendency to extravagance and lavish display which characterizes all of our leading sanatoria.

A CASE OF FRACTURED FEMUR TREATED BY THE AMBULATORY METHOD.

BY R. S. DUBS, M.D., CHICAGO.

The patient is a schoolgirl of 12 years. The fracture took place March 7, 1904, while the then 11-year-old patient was playing at jumping-rope in the school yard. Immediately after the accident she was placed upon a chair in a sitting posture and carried home, a distance of four blocks. She was seen by me within an hour of the accident. She was still sitting upon the chair with overhanging legs. A mere glance sufficed to make the diagnosis —fracture of the right femur in the middle third—so pronounced was the deformity. The patient was put upon a couch and gentle but firm traction applied to the leg. It was continued for the space of two or three minutes. This sufficed to reduce the deformity and to relieve the pain.

It was an oblique fracture of the middle third of the femur. Though easily reduced, there was a marked tendency toward shortening. However, the patient was young, crepitation was good along the whole line of fracture, so that there was every reason for kind union, if only an average amount of proper care were taken. Correct extension was the main requirement to be met. I determined to try the ambulatory method.

In the ambulatory method chosen, the weight of the body on the side of the fracture rests upon the ischial tuberosity, the fractured leg hanging free in full extension. When desired, this can be combined with traction upon the fractured leg.

According to Helferich, H. O. Thomas, of Liverpool, was among the first to make use of a serviceable splint for this method of treating fractures of the femur. His splint consisted of a padded ring, fitting snugly against the ischial tuberosity, connected by two tapering steel rods with a smaller metal ring at the bottom. The body rested upon the proximal ring, the leg hung free between the rods, the sole of the foot coming to within three or four inches of the lower plate. Naturally a compensatory high-heeled shoe was worn on the other foot. P. Bruns modified this splint in two particulars: (1) by cutting the rods and letting the lower fit into the upper, which makes it possible to shorten or lengthen the splint; (2) by adding a detachable extension

apparatus to the distal plate. Thus he could use this splint in the recumbent position. By merely removing the extension apparatus it became an ambulatory splint.

Hessing's splints are very complicated and have never been used to any extent. Still he was among the pioneers in the ambulatory treatment of femur fractures.

Some surgeons successfully treat fractures of the femur of the middle or lower third in the ambulatory manner by means of plaster casts. The most prominent of these are Tillmans, Korsch, Albers, and Dollinger. Their methods approach the principles of the above mentioned splints. Albers, for example, encases the limb below the fracture in plaster—*i.e.,* foot, leg, and knee. He then encases the proximal part of the thigh in a rather broad ring of plaster, which fits snugly against the ischial tuberosity. When these two separate parts have set, he encases the thigh and hips in plaster, the limb being energetically extended while this is being done. Thus the body weight is carried by a ring of plaster resting against the ischial tuberosity, the whole limb being quite immovably encased in plaster. Dollinger uses mechanical contrivances for more perfect and complete extension while putting on the third part of this cast.

The ambulatory pneumatic splint manufactured here in Chicago I found answered the requirements of my case very well. It embodies all the essential ideas of the above methods, and carries them out better than does any one of them. The limb is suspended from the ischial tuberosity (Thomas). The splint can be lengthened and shortened (Bruns). In that this lengthening is accomplished by a ratchet, it can be done with great force (Dollinger). Four, rather than two, lateral tubes give additional stability and enable the application of guiding pressure at the point and in the direction of choice. The splint consists of eight strong hollow metal tubes in the positions of the angles of a rectangle. These tubes telescope each other, the upper acting as a sleeve for the lower. Thus the splint can be readily shortened or extended. To the top is attached a circular pneumatic pad, upon which the ischium rests firmly. A rubber-soled plate is attached to the lower end. By the mere turning of a key this lower rubber-soled plate, with the tubes attached to it, may be shifted up or down, thus lengthening or shortening the splint. When the desired length has been attained, the upper and lower tubes are firmly locked by means of a lateral screw, so as to avoid all shifting or rotation. The leg is held in position and kept from lateral deviation by means of circular and lateral adjustable pads, placed along the side of the splint. When properly applied and patient stands erect, the anterior superior iliac spines should be in the same frontal and horizontal planes; the anterior superior iliac spine of the fractured side, the mesial margin of the patella, and the mesial margin of the great toe should be in the same line; the soles of both feet should be in the same plane. The sole of the fractured leg should be at least three inches above the lower plate of the splint. It is well, during the first week or two, to suspend the toes from the calf of the fractured leg, so as to have the sole of the foot horizontal. When walking, a compensatory high-soled shoe is worn on the other foot. Immobility of the hip-joint may be obtained by means of a metal abdominal band firmly fixed to the lateral side of the splint by means of an extension rod.

This splint was applied to the young patient several hours after the accident took place. By means of strips of adhesive plaster applied to the sides of the leg and attached to the plate below, rather than trusting to the anklet of the splint, traction was applied as stated above—*i.e.,* by turning the key and thus lengthening the splint the leg was readily extended to the normal without pain to the patient. The hip-

joint was immobilized, and the patient placed in the horizontal position upon a springless bed. Until the reactionary swelling had disappeared the leg was not disturbed. With the cessation of the edema new strips of adhesive plaster were applied, proper traction again made, and the leg was rubbed with alcohol twice each day. Because of the restlessness of the patient the leg had to be redressed several times within the first two and one-half weeks, for the tendency of the patient was to slide down into the splint, to get the ischial tuberosity below (distal of) the pad instead of upon it, thus escaping the pull of the applied traction. At the end of two weeks and five days the patient was allowed to get up and walk about

FIG. 1.—Roentgenogram, taken one year after date of fracture. Anteroposterior view. Middle third shows slight thickening and long oblique line of fracture.

with crutches, elastic traction being still applied. At the end of four weeks and five days traction was dispensed with. Five weeks and two days after the accident patient was allowed to discard the crutches most of the time. Eight weeks after the accident the splint was removed altogether.

cases, in the very fat, in the very muscular, in cases of compound fracture, etc. Still, by this method traction of great power can be obtained so easily and maintained so readily that the muscles are soon overcome, and this without pain to the patient. Thus by means of the extension apparatus the bone can be set

FIG. 2.—Roentgenogram, taken one year after date of fracture. Lateral view; small trochanter visible. The normal compound curve of the femur in this position is slightly exaggerated.

The result can be seen from these Roentgenograms and by examining the patient, who is present.

REMARKS.

1. At no time was an anesthetic used. It might be desirable, even necessary in some with little additional manipulation. If when the correct position has been obtained good crepitus is felt along the whole line of fracture, a correct result may be assuredly expected, provided this position is maintained. By the proper adjustment of the lateral pads

and the lower plate this can be done. In my case this was successfully accomplished, as the Roentgenograms prove, even though it was an oblique fracture.

2. Wherever there is a tendency to lateral deviation the counter-pressure can be accurately applied, at any place and in any direction, by means of the lateral pads.

3. The whole extremity is exposed to inspection with a minimum of trouble, thus enabling the surgeon to control the position of the parts and to correct it, if necessary, without discomfort to the patient. If desired, the patient can be taken to the laboratory and a Roentgenogram obtained. Furthermore, friction can be applied to the limb daily, which is a great boon to the patient.

4. My experience with this case would embolden me to allow the next patient to get up and walk about with crutches as soon as the reactionary swelling has disappeared. It appeared to me that the position of the leg was improved when the patient put the weight of the body upon the splint. The leg suspended from the ischial tuberosity is subject to autoextension, one might say, in that the part of the limb below the fracture acts as an extending weight. With properly guiding lateral pressure the position assumed by the leg while walking was quite natural. I would compare the treatment of fracture of the femur by this ambulatory method to that of fracture of the shaft of the humerus by means of an attached weight, which may also be ambulatory. Indeed, the favorable results I obtained by treating humerus fractures by this method encouraged me to adopt a similar method for this fracture of the femur.

5. Pressure is applied to the ischial tuberosity, to tissues adapted by nature to pressure, so that decubitus is not to be feared.

6. The helplessness of the patient and the tediousness and dangers of the dorsal position are avoided. I am convinced that the time of healing is shortened in that the application of friction, massage, and the use of the limb, protected by the splint, not only prevents the atrophy which accompanies the recumbent treatment, but promotes the trophic condition of the affected part, just as similar procedures would in like cases.

Scudder in his work on Fractures, 5th edition, page 340, accurately reports "the results obtained at the Massachusetts General Hospital in thirty-five cases of fracture of the femur, all of which were treated by Buck's extension, with outside T-splint or a long Desault apparatus, and toward the end of the treatment by a plaster spica of thigh, groin, and trunk, allowing walking with crutches." He classifies them as follows:

(*a*) In childhood, average age 7½ years. Fourteen cases. All perfect functionally. Four have slight pain at times, three of these four also slight stiffness at the knee.

(*b*) In adults, ranging from 18 to 48 years of age. Sixteen cases. Five perfect. Eleven have limited knee-joint movement with slight lameness and pain.

(*c*) In old age, average age 58 years. Five cases. None functionally perfect. Knee-joint painful and motion limited in all cases.

My experience with this case reported convinces me that these results can be vastly improved upon by the intelligent use of the ambulatory method in suitable cases. Indeed, the results obtained in the ambulatory treatment of fractures of the femur, by the use of this splint, are bound to be satisfactory if only ordinary care is given the case, provided that the care is correct and that the patient is one of average intelligence. The results are necessarily satisfactory, because the continuous inspection to which the limb is exposed must promptly disclose to the attentive surgeon any deviation from the desirable and demand immediate correction.

SCOPOLAMINE AND MORPHINE ANESTHESIA IN OPHTHALMIC SURGERY.*

BY GEORGE F. SUKER, M.D.,

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It is not necessary to dwell upon the self-evident fact that the ophthalmic surgeon possesses no general anesthetic which answers all the requirements for a perfect anesthesia, yet allowing him to have good control of the patient's voluntary ocular movements and not attended with such untoward after-effects as are customary when ether or chloroform is employed. It is with the greatest reluctance that he resorts to general anesthesia for intraocular operations when the globe is deeply inflamed because of these facts. Then, too, he often resorts to a general anesthetic because cocaine fails to produce the proper anesthesia, by using such quantities as would not endanger the integrity of the corneal epithelium or seriously interfere with the circulation of the anterior part of the globe, thus materially retarding the healing process.

Suffice it to say that a general anesthesia produced by any agent is a source of imminent danger to the life of the patient. It is not at all likely that a general anesthetic will ever be obtained that is free from all dangers, applicable to all patients, and suitable for all operations, either in general or special surgery; for, it is impossible to so disturb the balance between consciousness and complete surgical unconsciousness without profoundly affecting the vital equilibrium of organic inter-relationship of function. Therefore be it understood that scopolamine and morphine anesthesia has its distinctive drawbacks just as the accepted anesthetics of to-day. The selection of an anesthetic is but a choice of lesser evils, or one offering more of the desirable attributes an ideal anesthetic should possess. For this reason, scopolamine and morphine† invites our serious consideration.

Briefly, the dangers of this anesthetic mixture depend more upon the toxicity of its components and the inherent ability the patient possesses to withstand toxic agents of this kind than upon any other factors. It seems that in patients in whom trouble was encountered it could largely be ascribed to the rather large dose of morphine in this mixture. The patient gets proportionately a larger amount of morphine than scopolamine—*i.e.*, receiving within a very short time nearly the maximum dose of one and the extreme physiological dose of the other. As yet the physiological lethal dose of scopolamine remains undetermined.

The physiological action of scopolamine, according to Steinbuechel[7] (Schmerzverminderung und Narkose mit specieller Berucksichtigung der kombinirten Scopolamine-Morphium Anesthesia—Leipzig, 1902), is as follows:

1. Small doses raise blood-pressure by stimulating the vasomotor nerves. Larger doses lower it by influencing the cardiac excitomotor mechanism.

2. The pulse is usually slowed a trifle, but is ordinarily not influenced by small doses. Large doses cause a vagus pulse.

3. The cerebral cortex is rendered less excitable when stimulated by the faradic current. Sleep is induced, but not analgesia.

*Read before the Chicago Ophthalmological Society, Nov. 14, 1905.

†It is the hydrobromate of scopolamine which should be employed for these injections, preferably Merck's. Some experimenters, among them Ries, believe they get the identical results with hyoscine hydrobromate. Scopolamine is an alkaloid from *Scopolia carniolica*—so named after the Italian botanist Scopoli. There seems to be a diversity of opinion as to whether it is actually identical with hyoscine; if not identical, it is at least isomeric. The U. S. P. regards them as identical in their physiologic action. Some chemists maintain that hyoscine always contains scopolamine. Both are hypnotics, and the dose of either is 1/150 to 1/100 of a grain.

4. Respiration is not influenced by small doses. Large doses slow respiration.

5. The sweat, mucous, and salivary secretions are markedly diminished.

6. Mydriasis occurs in many instances—*i.e.*, when not instilled into the eye.

7. The motor-end apparatus supplying the intestine is paralyzed, and the tone of the splanchnic is increased.

8. It is excreted by the kidney.

Kochmann[2] is in virtual accord with the findings of Steinbuechel, and further says that the fatal intravenous injection is not known. He failed to produce death in a dog after an injection of 0.09 intravenously.

Given alone, scopolamine does not produce analgesia, but when combined with morphine an anesthesia is obtained usually sufficiently profound to execute any operation an ophthalmic surgeon might wish to undertake.

The injection of this combination does not always completely obtund the sense of touch; yet it reduces this sense so profoundly that by the addition of a drop of a five-per-cent cocaine solution complete surgical anesthesia of the eye is obtained.

As to morphine, Crile[19] has definitely proven that it greatly lessens the intensity of the various afferent nerve impulses going to the vasomotor center, because of the peripheral nerve stimulation; for this reason, the tendency to shock is reduced. Since scopolamine in small doses markedly raises blood-pressure by stimulating the vasomotor nerves, thereby materially aiding in minimizing shock, the combination of the two drugs seems a happy one. Indeed, Schneiderlin* (May, 1900) was the first to appreciate this fact, having successfully employed this mixture as an anesthetic for operations upon the insane.[1] Since then Blos[5] and Korff[14] have greatly improved and modified the dosage as well as the manner of administering it. Their method is as follows (employed by Ries,[10] Israel,[16] Zinke,[12] and others):

Scopolamine hydrobromate...gr. 1/50.
Morphine sulphate.....gr. ½.

Carefully dissolved in 3 drachms of distilled water.† The patient having been prepared in every detail as for the giving of any other anesthetic, one Pravaz syringeful of this mixture is injected into the arm two and a half hours prior to the specified time set for operation; the second syringe is given one and a half hours prior, and the third syringe half an hour before the specified time. It is desirable that perfect quietness surround the patient, as this materially hastens the induction of profound sleep. Though the patient apparently seems in the first stages of anesthesia about ninety minutes after the first injection, he still can be roused and will coherently answer questions. Because of this it is inadvisable to unduly disturb the patient, and hence it is good practice to have the patient upon the operating table when the third injection is given.

Shortly after the first injection the patient becomes sleepy and drowsy; after the second profoundly drowsy and sleepy; while at the time of giving the third injection he is scarcely sensitive to pain, though somewhat actively sensitive to touch. Half an hour after the third injection usually complete anesthesia obtains. Should this not be the case, then but a minute quantity of chloroform or ether, administered in a very restricted manner, is requisite. In fact, with a small amount of ether or chloroform an almost indefinite narcosis can be maintained. In view of this fact scopolamine and morphine injections are a decided advantage in ether or chloroform narcosis, as the stage of excitement is practically eliminated.

*Schneiderlin used scopolamine extensively as a hypnotic among the insane patients, and used it to counteract the evil effects morphine has upon the pulse and blood-pressure.

†Scopolamine in solution is not very stable, therefore a fresh one should be made for every anesthesia.

For ophthalmic operations oftentimes but two injections will answer, provided one or two drops of cocaine are instilled into the eye. By this procedure you can comfortably and safely operate upon painful glaucomic eyeballs without inflicting any pain; and yet, the patient, though apparently comatose, is able to turn the eye in any desired direction, and hold it there. This sometimes holds true after three injections, but not as a rule, as after the third has taken effect the patient is practically in the surgical anesthetic stage. Often the patient scarcely feels any pain, but still retains the sensation of touch shortly after the second injection. It is this long-continued acute sense of touch which interferes with operations in this stage—the constant flinching of the lids and the unconscious rotating of the globe when the forceps are applied. It is not until the third injection is given that this sense of touch is sufficiently reduced as not to be a menace if you do not wish to employ cocaine during any stage of the operation.

Ries[10] is experimenting with injections of the separate respective doses of scopolamine and morphine at alternating intervals to see whether complete anesthesia can be produced. It seems that the combination as at present employed, though it produces analgesia, can be materially improved upon as regards quantity in order to further minimize the attending risks. Experiences of others so far show that this anesthetic is safe in patients who have albumin and other organic changes in the urine. Indeed, in one of my patients I absolutely refused to give ether or chloroform because of the excessive amount of albumin associated with valvular heart lesions, and yet the scopolamine and morphine caused no apprehension at any period. Ries has had the same experience in a great number of patients with urinary changes. Because of the stimulating effect of the scopolamine upon the cardiovascular system, patients with cardiac irregularities seem to act nicely under this anesthetic.

The patients scarcely ever realize that they have been removed from their bed, and seldom complain of postoperative pain. On the contrary, they enjoy peaceful rest all the way from fifteen to twenty-four hours after the operation. This readily appeals to the ophthalmic surgeon, especially when in addition the patient seldom if ever vomits, retches, or restlessly tosses about, thus not interfering with the primary agglutination of the corneal wound. There practically is no stage of excitement in giving this anesthesia. It is not as useful in the young as in the adult. The former do not tolerate with as much safety such large doses of scopolamine and morphine, given within so short a period of time.

The application of this anesthesia in a modified form as suggested is acceptable in cataract operations upon nervous and restless patients. Though according to Blos hysterical patients do not respond very nicely, yet Ries, Schneiderlin, Israel, and others have not found this to be clinically true.

The deaths reported (Flatau,[3] Israel,[16] Dork,[17]) cannot be directly ascribed to the scopolamine or morphine, as in all of them rather large quantities of chloroform were simultaneously administered. In all of the cases chloroform was at least an accessory. In three of Dork's patients the extreme age, 69 to 76, and other causes were held accountable. Israel lost one patient on the table, and two others died several days later, yet he does not specifically ascribe their death to the scopolamine or morphine. It seems that the addition of rather undue amounts of chloroform increases the toxic effects of the morphine (Monod[13]). Some patients have an idiosyncrasy for the scopolamine just as they can have for atropine. In such instances no harm is done, as not more than one injection need ever be given before the

idiosyncrasy manifests itself, the patient having received but the physiological dose of each, 1/150 and 1/6 grain respectively.

This form of anesthesia appeals to ophthalmic surgeons, because of the rather unusual muscular relaxation supervening even after a single injection, which is so desirable for intraocular operations. Even after the second injection the patient is still sufficiently conscious to explicitly obey the orders of the surgeon, in itself a valuable feature. This anesthesia is desirable in that class of operations wherein cocaine does not produce the requisite anesthesia, and where ether or chloroform narcosis is a decided detriment because the surgeon loses control of the voluntary eye movements of the patient. Then, too, it is the long period of continued rest which is an exceedingly efficacious feature with this anesthesia.

A careful perusal of the literature and case reports by those who have employed scopolamine and morphine anesthesia will demonstrate:

1. That there is practically no stage of excitement even if ether or chloroform is employed.

2. That small quantities of ether or chloroform will maintain prolonged anesthesia; but great diligence needs be exercised in administering the latter.

3. That frequently operations can be satisfactorily performed without resorting to the addition of chloroform or ether.

4. That seldom, if ever, is there any muscular rigidity; on the contrary, an extreme relaxation ensues.

5. That there is an almost complete absence of the annoying, distressing, and often disastrous effects which frequently follow a narcosis.

6. That urinary or cardiac abnormalities offer less apprehension than when ether or chloroform is given.

7. That patients rally from this anesthetic, not by shock or emotion, as often occurs with ether, chloroform, and particularly with ethyl chloride, but they have a peaceful awakening.

The unstinted praise accorded this scopolamine-morphine narcosis for general surgery by such men as Ries, Israel, Dork, Semon, Whitacre, and others tempted me to employ it in those instances in which cocaine usually fails to answer the purpose, and in which the voluntary rotation of the eye by the patient is a decided benefit to the operator, *e.g.* acute glaucoma, cataract extractions in nervous and excitable patients, and for keratectomy combined with Schoeller-Kuhnt's graft and enucleations. So far I can heartily indorse the opinions of the general surgeon.

This anesthesia has its limitations, but what narcosis has not? Then, too, the method is comparatively new and our mode of administering this mixture not altogether faultless; therefore a final opinion cannot be legitimately pronounced. Up to the present date perhaps not more than 3000 anesthetics have been given with but six recorded deaths, and these are directly attributable to its effects. Nevertheless, the scopolamine-morphine narcosis, either pure and simple or as an adjunct for ether and chloroform, certainly appeals to surgeons and is worthy of their extended trial before condemning it. In a measure it is in its developmental stage.

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THE DIAGNOSIS OF NEURASTHENIA.[1]

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Patients daily present themselves in physicians' offices complaining of nervousness. Nervousness is to many an uninviting subject, organic diseases of the various viscera or organic diseases of the nervous system appearing clinically far more interesting. When we actually study the cases, however, we find that the field becomes as attractive as any in medicine, while its daily practical importance cannot be overestimated. Whenever a patient complains of nervousness, no less than five possible conditions should be borne in mind. In the first place we should think of the three great neuroses—that is, neurasthenia, hysteria, and hypochondria. Further, we should bear in mind the various nervous states prodromal to the fully developed psychoses, such as the prodromal or developmental period of melancholia, of paranoia, of dementia precox, and the like. To these states, which never present the symptom-group of neurasthenia, I several years ago applied the term "the neurasthenoid states." The symptoms which they present are never truly neurasthenic; they are simply like or grossly resemble neurasthenia, and are properly speaking therefore neurasthenoid. Finally, we should bear in mind the nervous symptoms which accompany various visceral and general diseases, organic and functional. Here again the nervous symptoms are never those of true neurasthenia, and there is present merely a neurasthenia symptomatica. Such a neurasthenia symptomatica is typically present in chlorosis and in other blood diseases. It is usually present in diseases of the various viscera, and this fact makes it imperative that every case should be exhaustively studied from the standpoint of internal medicine. It is for this reason that the diagnosis of neurasthenia so often merely means an imperfect diagnosis.

When we come to study neurasthenia in detail we find that its symptoms are essentially those of chronic fatigue, of a fatigue which has become exaggerated and pathological, and it is for this reason that I many years ago applied to neurasthenia the term "the fatigue neurosis." This means something more and something slightly different from a neurosis of chronic exhaustion—for exhaustion, as I have already hinted at, may ensue from various diseases of the viscera, of the blood, of the organism as a whole, a toxemia, or an infection, as the case may be.

The symptoms of neurasthenia on the surface appear to be at first sight hopelessly multiple and complex, but it soon becomes evident

[1]Read before the Philadelphia County Medical Society, Nov. 8, 1905.

that they possess unequal value. This indeed was recognized by Charcot years ago, who separated out a group of symptoms which he spoke of as the cardinal symptoms. He grouped them roughly as follows: Headache, sleep disturbances, rachialgia, spinal hyperesthesia, muscular weakness, dyspepsia, genital and psychic disturbances. All other symptoms he termed secondary or tertiary. Charcot evidently selected as his cardinal symptoms those which present themselves with a certain degree of frequency. He does not appear to have made use of any other guiding principle. However, if we conceive the idea of neurasthenia as being the neurosis of chronic fatigue, the clinical picture at once becomes clear. For instance, all the affections which present themselves in such generalized form, as do neurasthenia, hysteria, and hypochondria, present symptoms which are readily classifiable as *sensory, motor, psychic,* and *somatic* symptoms. As soon as we begin to analyze the symptoms of neurasthenia in a systematic manner, we find that the sensory symptoms, to begin with, express themselves first in *generalized fatigue sensations*—that is, general sense of tire, general sense of weakness; secondly, as *localized fatigue sensations,* such symptoms as headache, backache, and limbache. When we turn our attention to the motor symptoms, we find present, in varying degree, muscular fatigue, muscular weakness, and above all ready muscular exhaustion. When we turn our attention to the psychic symptoms, we find first and foremost a diminution in the capacity for sustained mental effort, ready mental exhaustion, and diminution in the spontaneity of thought. When we turn our attention to the somatic symptoms, we note especially atony of the digestive tract, atony of the circulatory apparatus, and disturbances of the secretions which can only be interpreted as signs of weakness and deficient innervation, and finally disturbances of the sexual functions which can only be similarly interpreted. The above symptoms I have termed the primary or *essential* symptoms of neurasthenia; the other symptoms that make their appearance I have termed the secondary or the *adventitious* symptoms. The essential symptoms are always those of chronic and persistent fatigue, while the adventitious symptoms are, as we shall see, its secondary outgrowths.

Sensory Symptoms.—The symptoms become more interesting when studied in detail. Beginning with the sensory phenomena we have, to repeat, first vague fatigue sensations, generalized in character. The very first thing the patient tells us is that he is tired, that he is tired all of the time, that he feels like lying down—indeed, that he is often compelled to abandon his work and to rest before he can again resume it. There is present a general sense of tire. This symptom, as I have just pointed out, is one of the essential symptoms. Not infrequently there are present associated or secondary symptoms direct outgrowths of the generalized fatigue: for instance, the patient not infrequently presents a feeling of uncertainty in regard to his movements or in regard to his environment—*i.e.,* he sometimes complains of being giddy or dizzy without presenting any symptoms of real vertigo. Indeed, mild forms of dizziness are very frequently noted. This symptom is undoubtedly one directly referable to the asthenia, and it appears to be due to the lessened vasomotor tone of the cerebral vessels, so that slight efforts or changes of position affect the intracranial circulation. It is not impossible, on the other hand, that at times this symptom is due to an actual weakness of the various centers concerned in coördinated movement. At any rate this dizziness is a *secondary* and not a primary symptom.

In addition to the general sense of tire we have, as already stated, sensations of fatigue, more or less distinctly localized, such as head-

ache, backache, or limbache. These localized achings are to be regarded as exaggerated fatigue sensations and are among the primary symptoms of neurasthenia. In early cases they disappear upon rest as do other fatigue sensations, though in cases of long standing they may only be relieved and not disappear altogether upon the cessation of work. For instance, concerning headache, the average statement by the patient is that mental effort of any kind brings it on, or if it be already present, makes it worse. The headache is diffuse in character and is usually most pronounced in the occipital region, though it may be frontal or widely diffused. Not infrequently we have associated with this headache, sensations of pressure or constriction, more especially drawing sensations in the occiput and in the back of the neck, a sense of lightness or emptiness of the head, or, on the other hand, of heaviness and fulness. These sensations are unquestionably to be classed among the *secondary* or *adventitious symptoms*. They are probably to be referred to the secondary vasomotor changes, and are in themselves only indirectly the outcome of the chronic fatigue, like the symptoms of dizziness already referred to.

The backache is usually referred to the small of the back, sometimes to the midscapular region, and at times to the sacrum. This diffuse aching, like the headache, must be regarded merely as the expression of an exaggerated fatigue sensation, and constitutes unquestionably one of the *primary* symptoms of neurasthenia. Not infrequently, however, we have, as in the case of headache, secondary symptoms also making their appearance. Thus there may be present tenderness over the spine to pressure, a tenderness which is as a rule most marked in one or more of the following regions: over the seventh cervical spine, over the middorsal region, over the dorsolumbar juncture, over the midlumbar region, over the sacrum, or over the coccyx. These regions of tenderness constitute the symptoms which gave rise to the term "spinal irritation" employed by the physicians of a previous generation. Sometimes there is present in addition to these symptoms of spinal tenderness or "spinal irritation" also spontaneous pain or aching referred by the patient to the substance of the spine itself. It is extremely probable that these secondary symptoms are merely the indirect outgrowths of greatly exaggerated fatigue sensations. Occasionally other areas or points of tenderness are noted in neurasthenia, such as tenderness of the teeth or gums, and sometimes diffuse tenderness of the entire head (never, however, the localized tenderness of the clavus of hysteria).

The aching of the limbs, like headache and backache, is as already stated to be considered a primary symptom. Not infrequently this aching bears a direct relation to the occupation of the patient, as for instance aching in the legs in a collector, letter-carrier, or salesman, or aching in the arms in persons with occupations in which the arms are used excessively. In addition to the simple aching, other symptoms, secondary in value, are occasionally noted: for instance, subjective numbness, pricking, formication, velvety sensations, or a subjective sense of heat or cold. The adventitious character of such symptoms is self-evident. It is to be especially noted that sensory loss, anesthesia, is never present.

When we turn our attention to the special senses we find a similar interesting aggregation of symptoms, readily divisible into primary and secondary phenomena. As regards vision, we have first and foremost the symptoms of ready fatigue. This fatigue is as a rule complex in its origin. Various elements, muscular, retinal, and cortical, play a rôle. Thus weakness and ready fatigue of the intrinsic and extrinsic muscles of the eye, weakness and irritability of the retina, and ready cortical exhaustion play rôles varying in

degree in different cases. It is for this reason doubtless that mere correction of the eyes by glasses as a rule fails to relieve the eye symptoms of which the neurasthenic complains. The ready fatigue of the retina can be demonstrated in various ways. Thus there may be a loss of power to perceive continuously a small object held at convenient focal distance from the eye. This is observed every now and then in examining a neurasthenic patient with the perimeter; the point of fixation readily seen at first becomes, as the examination proceeds, less and less distinct until finally it disappears. This phenomenon must be distinguished from a similar fatigue symptom observed in healthy persons by remembering that in the latter it is noted only after a very prolonged effort. Ready retinal fatigue may also be demonstrated by studies of the field. In the beginning of an examination the answers given by a patient usually indicate a normal field. However, if the examination be prolonged or if the tests be frequently repeated, the answers become less and less certain as regards the periphery. This is more especially noted if the test object is moved from the center of the field toward the periphery. In addition to the symptoms of ready exhaustion, secondary symptoms are quite frequently present. Thus the patient will often state that everything seems "misty," that everything looks as though it were seen through a veil, or he may complain that objects look dull or unusually bright to him. At times, too, irritability of the retina is so pronounced that the patient begins the use of smoked glasses of his own accord.

Disorders of hearing present the symptom of localized fatigue less plainly than do the disorders of vision. However, neurasthenic patients will often say that they cannot "hear right," though this symptom when investigated as a rule proves to be psychic and not directly referable to the ear—that is, it is due to lack of the power of sustained attention and not to any true difficulty of hearing. However, comparable to retinal hyperesthesia, we frequently have auditory hyperesthesia, and this may be pronounced in degree. The patient may suffer exquisitely from noises, even when the latter are insignificant. Secondary auditory symptoms are also prominent; especially is this true of tinnitus. A very large number of patients complain of ringing in the ears. At times such expressions as "roaring," "buzzing," "whistling," "beating," "throbbing," or "ticking" are employed by the patient. With regard to smell and taste, fatigue symptoms are not obvious; however, olfactory hyperesthesia is not an infrequent symptom of neurasthenia, the patient complaining inordinately of odors not especially noticed by healthy persons. Again, neurasthenic patients are notoriously peculiar in regard to their eating, often presenting extreme dislike of various wholesome articles of food. It is not impossible that these dislikes are in part at least owing to modifications of the sense of taste, similar to those presented by the other special senses.

Motor Symptoms.—When we turn our attention to the motor symptoms in detail we find, as already stated, as the primary symptom, ready exhaustion. The sense of weakness is as a rule referred to the legs and small of the back. There is, however, never any local weakness, nothing in the faintest degree suggesting a paresis or paralysis. Among the secondary motor symptoms we note especially tremor. This tremor is an intention tremor and is usually fine in quality. There may also be noted at times slight spasms or twitchings in small muscular bundles here and there: for instance, in a few fibers of the frontalis of the one side, or perhaps of one or both orbiculares palpebrarum. Less frequently similar twitchings are noticed in other facial muscles. These twitchings or slight spasms are rarely persistent and form a very unimportant part of the symptom-complex. Occasionally entire

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muscles or muscle groups are affected by cramp or spasm. Such cramps are not infrequently observed by the neurasthenic in the calf muscles when he retires at night. They are of course to be regarded as indirect outgrowths of the fatigue.

The tendon reactions of the neurasthenic may be normal. More frequently, however, they present the symptom of irritability, and we find therefore that in the majority of cases the knee-jerks are decidedly increased. Now and then, due doubtless to lowered muscular tone, the knee-jerks are diminished; they can, however, always be well reënforced. Occasionally also an ankle clonus is noted; it is, however, never so marked nor so prolonged as we find it in organic disease. It is most frequently faint and disappearing.

Psychic Symptoms.—When we turn our attention to the psychic disturbances we find again as the most striking symptom a diminished capacity for sustained effort. Just as the patient is incapable of long-continued physical effort, so is he incapable of long-continued mental effort. The attempt to do brain work sooner or later brings on symptoms of exhaustion. The patient finds it more and more difficult to sustain his attention, and at last fails altogether to do so. This, which is the essential and intrinsic psychic symptom of neurasthenia, often alarms the patient very greatly. He fears that he is about to lose his mind. Indeed, nothing is more common than to have the patient complaining of a "loss of memory." Notwithstanding he will usually give a most circumstantial history of his case, not omitting unimportant details, and will otherwise show that there is no real loss of memory. The difficulty he has noticed is really due to lack of power of concentrating his attention for a sufficiently long period upon a given task. This is the true explanation of the apparent weakness of memory every now and then noticed in neurasthenic patients. The patient does not remember because he has really never taken in or, properly speaking, apperceived, that which he has read or heard. The idea of impending loss of mind is also suggested by the fact that ideas do not present themselves as readily as in health. There is a true lack of spontaneity of thought, and this the patient makes known to the physician by the familiar expression that "he cannot think." Like the failure of the power for sustained attention, it is only another sign of fatigue.

The secondary psychic symptoms of neurasthenia are intensely interesting and would justify a much more elaborate consideration than is permitted by the present paper. We note, first, that the man who is chronically tired loses some of his personal force, aggressiveness, and will-power. Secondly, coupled with this lack of will-power, hesitation, uncertainty, indecision, sooner or later make their appearance. Thirdly, there is also a markedly increased irritability. That the tired man is cross is as well known to the laity as to ourselves, and this irritability is merely the expression of a more or less marked loss of self-control or inhibition. The chronically tired man is more readily angered, or, on the other hand, is more readily brought to tears, than is the man who is well. Fourthly, should the opportunity arise, we would also note that the man who is chronically tired is also afraid; for weakness and fear inevitably go hand in hand. Indeed, it is a well-known fact that neurasthenics are subject to spontaneous attacks of fear—fear causeless in origin and generalized character. Sometimes these attacks of fear are accompanied by pallor of the face and palpitation of the heart, just as is normal fear. More rarely they are accompanied by the most pronounced signs, the patient suffering from sudden weakness, pallor, coldness of the surface, excessive tachycardia, and even relaxation of the sphincters. Such attacks are commonly mistaken for attacks of

hysteria, but they bear no resemblance whatever to the latter affection. It should be added that occasionally the attack of fear is not accompanied by any physical symptom whatever. These interesting secondary symptoms, the diminished personal force, or *diminished will-power,* the *indecision,* the *loss of inhibition,* and the *fear,* may in neuropathic subjects give rise to the various so-called neurasthenic insanities; thus in a patient of pronounced neuropathic heredity—never in a normal individual—diminished will-power may give rise to *aboulia;* an impairment of decision to a true insanity of indecision, a *folie du doute;* a loss of inhibition may give rise to one or more of the various *obsessions,* the so-called insanities with *irresistible impulse;* and a generalized *fear* may give rise to one or more of the *special forms of fear,* such as agoraphobia, claustrophobia, and the like. It cannot be too strongly insisted upon that true and uncomplicated neurasthenia never terminates in mental disease. In a non-neuropathic subject a neurasthenia will always remain a *neurasthenia simplex,* no matter how profound it may become. In order that the special symptoms I have just noted should arise the patient must be essentially neuropathic—that is, have within himself the soil of mental disease. In neuropathic subjects mental fatigue is prone to develop just this class of symptoms; the symptoms each betray the essential characteristics of a degenerative psychosis—that is, fixation and the pathological association of symptoms. Thus we may see in a neurasthenic man, but who is also neuropathic, an attack of spontaneous fear come on while in the street. At once there comes into his mind an association between the place in which he finds himself—the street—and his attack of fear; and an agoraphobia, fixed and persistent in character, becomes established. For this special group of mental disturbances the term neurasthenic insanities is clearly a misnomer. I propose speaking of them myself in the future as the "neurasthenoid insanities."

Somatic Symptoms.—The somatic symptoms of neurasthenia, like the other symptoms thus far detailed, present as their essential characteristic ready exhaustion. Thus we have, as the cardinal symptom of the indigestion of neurasthenia, atony, delay, and enfeeblement. Nothing is more common than to have the neurasthenic patient complain of a sensation of weight and fulness after eating and of eructations of gas, a gas which is always tasteless. The disturbance of digestion may be intestinal as well as gastric, or the patient may complain of abdominal distention, while constipation is almost the rule. Secondary symptoms are of course present here as well as elsewhere. The indigestion may become so pronounced as to lead to the production of a secondary gastric catarrh. On the other hand, the nervous weakness may manifest itself not so much by atonicity of the bowel—that is, constipation—as by looseness, and the patient may not infrequently present the symptoms of sudden and precipitate bowel movements accompanied by sudden faintness and prostration.

The disturbances of the circulatory apparatus consist in modification of the force and rhythm of the heart's action, in the character and frequency of the pulse, and in more or less marked alterations of vasomotor tonus. Perhaps the most striking, if not indeed the most common, symptom of circulatory disturbances is palpitation of the heart. While frequently associated with digestive disturbances, it is by no means dependent upon the latter and frequently comes spontaneously. We note also coldness of the hands and feet. Sometimes lividity, local flushings, and other signs of vasomotor disturbance are noted. The circulatory disturbances, like the digestive disturbances, are to be referred to diminished or defective innervation, and are as much the

expression of fatigue as are the other symptoms already considered. Secondary circulatory disturbances are not numerous. However, the throbbing and other sensations referred to the head, trunk, or to the limbs are doubtless to be classed among them.

The disturbances of the secretions, more especially of the skin and of the kidneys, are to be referred to defective innervation. Nothing is more common, for instance, than to find the neurasthenic patient with moist hands and moist feet, and also presenting the history of excessive sweating of the neck and head or body upon slight exertion. On the other hand, there may be excessive dryness of the skin. As regards the urine, the quantity voided may be decidedly increased or simply diminished. Slight excitement or occasional disturbance is often followed by the voiding of a large quantity of urine. In other neurasthenics again we may find that the quantity of urine passed in the twenty-four hours is greatly diminished; indeed, this is rather a common experience. The secretions, both perspiration and the urine, may also show chemical modifications and other changes secondary in character which time will not permit us to dwell upon. Suffice it to say that the symptomatology of the secretions differs in no essential particular from the general symptomatology already considered.

The sexual disturbances of neurasthenia are notably those of ready exhaustion, weakness, and irritability. The patient complains for instance of diminished sexual power, of premature ejaculation, and of diminution of the sensations normally accompanying the sexual act. Numerous variations of these symptoms, depending upon the sex of the patient and the habits as regards continence or incontinence, may also be present. They are of the nature of secondary manifestations. Time will not permit us to enter into them here. Occasionally they are so pronounced as to dominate the clinical picture, and then give rise to that form of neurasthenia which has been described as sexual neurasthenia by some of the older writers.

The above outline of symptoms is that of true neurasthenia, the form which I have termed neurasthenia simplex. It is as far as we are able to determine a purely functional disease, and yet there is reason to believe that if neurasthenia simplex lasts for a long time—that is, many years—it may result in a premature senescence of the tissues; it then becomes incurable. I have spoken of this form of neurasthenia as "neurasthenia terminalis."

Differential Diagnosis.—In considering briefly the differential diagnosis of neurasthenia we must bear in mind the various states that I have spoken of. These, it will be remembered, are five in number: first, neurasthenia; secondly, hysteria; thirdly, hypochondria; fourthly, the neurasthenoid states; and fifthly, neurasthenia symptomatica. Hysteria to begin with is readily differentiated by the fact that there are always present some of the stigmata of hysteria, such as areas of anesthesia, palsies, contractures, special forms of cutaneous painful hyperesthesia, the psychic symptoms, and the history of paroxysmal attacks. No such symptoms are present in neurasthenia. We should, however, bear in mind that every now and then neurasthenia and hysteria coexist in the same patient.

In regard to hypochondria, we note first the absence of all physical signs, motor, sensory, or visceral, with the possible exception of slight atonicity and catarrh of the digestive tract; secondly, we note an all-pervading and convincing sense of illness, together with a fixed belief of the patient that he is ill and that he requires medical care. Sometimes the idea of illness centers about special organs, such as the eyes, the stomach, or the sexual apparatus. It is noteworthy that not one of the symptoms entering into the syndrome of neurasthenia is

present. Vague sensations of all kinds are complained of, it is true, but the signs of chronic fatigue are absolutely wanting.

In regard to the neurasthenoid states, we should bear the same fact in mind. The symptom-group of neurasthenia is conspicuous by its absence. Other vague nervous manifestations are present, but they bear a psychic impress and we soon become aware that we have a mental case to deal with; it may be an early period of a melancholia, a paranoia, a paresis, or possibly a neurasthenoid insanity.

Neurasthenia symptomatica likewise fails to present the symptom-group of chronic fatigue. A careful internal examination will sooner or later reveal the evidences of actual visceral disease, such as an unsuspected ulcer of the stomach, chlorosis, or some exhausting affection. I may remark in passing that we never find changes in the blood in neurasthenia. It is not an uncommon error on the part of physicians to believe that in neurasthenia we have anemia. As a matter of fact such a condition is never present.

THE EARLY ARREST OF INFECTION.

BY ERNEST LAPLACE, M.D., LL.D.,
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The progress of bacteriology has shown the complex nature of infections. This exists from the very first. As there are but two channels of infection, the lymphatic and the venous system, cases of infection can be divided into two kinds: cases of lymphangitis and cases of septicemia.

The great part played by the lymphatic system in infection has perhaps never been fully understood. At the last meeting of the British Medical Society, Mr. C. J. Bond, in a masterly address on "Ascending Currents in Mucous Canals and Gland-ducts," pointed out the rapidity and ease with which sterilized pigments, such as indigo, carmine, and litmus, are introduced into the lymphatic channels in health, and are carried to various portions of the body; and this with startling rapidity. This phenomenon shows the readiness with which certain infectious bacteria are absorbed and carried from an abrasion to remote portions of the body, either through the lymphatic system or the venous system.

The day is still distant when every infectious germ will be successfully combated by an appropriate antitoxin. Still more difficult is the problem of combating in this manner cases of mixed infection in which two dissimilar infectious organisms develop at the same time, having found entrance through the same wound.

We are apt to delay the treatment of an infected wound until the symptoms are such that they already create alarm. We rely on the invasion of the phagocytes for the early destruction of an infection which we do not think as yet worthy of surgical attention. This explains the fatal cases of infection arising from apparently trivial wounds, which at the time of infection did not seem to attract any particular notice, and hence were neglected as far as treatment was concerned. The day must come when such cases will cease to exist, and its arrival will be hastened by realizing that an infection is most easily arrested in its primary stages, and that it is still more readily prevented than arrested.

This is a plea for considering all abrasions of the skin and traumatisms—no matter how slight—as possible avenues for infectious organisms, and the starting-point of an infection, the danger of which is unknown, but which may be exceedingly serious. Many cases of severe and dangerous infection fol-

low an abrasion of the skin, scarcely noticeable at the time, but deep enough to open the superficial lymphatics without showing a trace of hemorrhage.

These unnoticed but infected injuries are to my mind often more serious than those which attract attention and are treated, for, being unnoticed, the infectious organisms enter the lymphatic channels, and reach advanced development before any treatment is instituted.

An axiom admitting of no exception is the following: every abrasion of the skin should be considered a possible avenue of infection until healed. It is only by realizing the importance of the smallest injuries, and apparently harmless pathological conditions of the skin, that eventually the more serious forms of infection will be prevented.

The antiseptic idea should dominate the treatment, and this course is quite usual to-day; but I maintain that any antiseptic will only exert its influence upon such germs as it actually reaches and destroys by chemical affinity. The problem remains to remove so far as possible all the organisms which have entered the lymphatic vessels, and are already beyond the reach of the antiseptic. This can only be done by drainage.

The conception of drainage as here intended is quite a special one. It resolves itself into an incision, and the mechanical removal by the resulting hemorrhage of all the surface germs. Next and most important is the massage or "milking" of the parts from all directions toward the seat of the infection.

A remarkable phenomenon which I have observed while carrying out this practice is the following: After making an incision, and causing a certain amount of hemorrhage by pressing the parts, we find that when the hemorrhage has stopped, should the wound be pressed again, a certain amount of serum exudes. Repeating this squeezing or "milking" after a minute or so more serum exudes, and then stops; when we resume this squeezing after a few moments still more serum or lymph exudes; and so we can repeat this procedure five or six times within an hour, and always withdraw from the wound a small amount of serum. This serum has been found to contain the staphylococcus and streptococcus, even the fourth and fifth time the wound was squeezed, showing that the organisms had invaded the lymphatics, and the squeezing having been repeated, gradually brought them down the same road they had already traveled, back into the wound.

When the hemorrhage stops the wound is cauterized with pure carbolic acid. This invariably alters the parts, so that a fresh hemorrhage ensues. Further squeezing facilitates the flow of blood, and also increases the subsequent flow of serum or lymph. A dry dressing completes the treatment.

The lymphatic channels are narrow, and if opened the lymph that is contained beyond the opening—both above and below—can be squeezed out into the opening. In this way the infectious organisms are removed mechanically to a greater extent than by the usually adopted methods.

Should the case already show marked and spreading infection, I add to the above procedure a scarification of the reddened area; this being done, the drainage of the part is mechanically produced by squeezing as before.

When the lymphatic channels are thoroughly emptied, an ice-cold antiseptic solution is applied to the parts for the purpose of giving direct entrance of the antiseptic into the affected lymphatic channels laid open by the scarification, in this way destroying the germs which may linger within the lymphatics. The solution used consists of

Bichloride of mercury.....	1 part.
Hydrochloric acid	5 parts.
Water 1000	parts.

Should pain result from this application, the solution may be made weaker.

This local treatment may be repeated as often as necessary, to prevent infection gaining headway. When the treatment is given as a preventive, this procedure may be resorted to but once; but if the infection has already fairly started it should be repeated at least twice a day until the infection is controlled.

Constitutionally, tincture of chloride of iron comes nearer being a general antiseptic than any other drug; 10 to 20 drops administered every three hours would seem to chlorinate the blood and strengthen the system. Its action is certainly enhanced by moderate doses of strychnine to promote the activity of the circulation, and hence put the phagocytes at their best for doing such germ-destroying as is in their power.

For the last ten years I have invariably adopted this course in the treatment of all minor wounds—such as infected cuts, scratches, excoriations, infected pimples, and erythema from starting erysipelas—and have always succeeded in checking the infection.

My warning here is simply this: That prevention is easier than cure; that infection is more easily overcome, the earlier it is treated; and that, finally, all wounds should be considered dangerous until the contrary is shown.

THE STUDY OF TROPICAL MEDICINE: ITS AIM, ITS METHOD, AND ITS SCOPE.[1]

BY F. C. WELLMAN.

The remarkable and general interest in the problem of tropical pathology which now exists is of comparatively recent growth. When Dr. (now Sir) Patrick Manson, then a medical missionary in Amoy, China, published his study of *Filaria sanguinis hominis* in 1883, but little scientific knowledge of tropical ailments had been collected. So that it may be truthfully said that Sir Patrick has seen in his own professional lifetime practically the whole development of the great subject to the advancement of which this society is devoted. And this activity has been redoubled within the last few years. The establishment of schools and professorships of tropical medicine in London, Liverpool, Paris, Hamburg, Lisbon, and different parts of the United States, the founding of the *Journal of Tropical Medicine,* the organization of the American Society of Tropical Medicine, the various scientific expeditions sent out from America, England, and Germany for the study of tropical diseases, and the enormous literature dealing with this department of medicine, all emphasize this activity. It is in the hope of possibly increasing the gratifying interests already obtaining in the important subject under review that I have ventured to address you on this occasion.

Before entering upon the discussion of our topic, a word as to the form in which it has been announced may not be considerd out of place. The term "tropical medicine" has been objected to, and, while a convenient designation, is (it must be confessed) apt to be misleading to those whose interest in and knowledge of the subject is slight. Of course scientific medical men know that there are almost no tropical diseases in the strict interpretation of that term. In short, it is just as allowable to speak of tropical zoölogy or tropical botany as of tropical pathology—really one might almost as well say tropical chemistry. All pathology is one, be it arctic, temperate, or tropical. Still the term has done good. It has been a watchword, it has stood for a fine type of specialization, and it has served well as the expression of a point of view from which various important diseases new and old have taken on

[1]A paper read before the American Society of Tropical Medicine, 1905.

a different meaning, the practical outgrowth of which has, in not a few cases, meant the physical betterment of millions of human creatures. As a fortunate result of this the time has now come when no one can claim to be *au courant* with the science of general medicine without an appreciative acquaintance with the leading facts of tropical pathology. So the term can be said to have fully justified its adoption and to deserve well of us.

In speaking of the aim of our Society and the movement it represents, it may be well to premise in the first place two or three statements which can hardly be disputed. These are as follows:

1. The successful settlement of the tropics is of very great importance to the world.

2. Such settlement depends in no small measure on the solution of various hygienic and epidemiological problems there obtaining.

3. In the absence of this knowledge an enormous extra expenditure of lives and money is certain to ensue.

4. The problems in question can best be studied and met by trained observers working at first hand—in other words, by scientific medical men living in the tropics. With these points before us there is no occasion for me to dwell on the necessity for adequately equipped pathologists, clinicians, and sanitarians, specially trained in the lines along which their investigations will run, to take up the enormous task awaiting them. It is little less than a cardinal sin to send a poorly equipped man to the tropics. With the urgent need for exact knowledge concerning the geographical distribution of tropical disease conditions and the factors necessary for their maintenance (upon the possession of which depends such vast issues), and the almost infinite possibilities of tropical hygiene before our minds, I shall leave the further contemplation of our aim as students of tropical medicine and pass to my next point.

I can probably discuss methods of study in no more profitable manner than by using as illustrations some of the best work that has been done in the past. The time is too short to admit of detailed examples, but on the subject of animal parasites (of peculiar interest to us) the sound work of a host of men from Cobbold and Leuckart to Blanchard, Stiles, and Braun is ever before us; while on malaria the brilliant researches of Laveran, Manson, Ross, and the Italians (not to mention our own American confrères, from among whom none would omit the names of King and MacCallum) leave almost nothing to be desired. In the science of bacteriology, too, it would be almost invidious to single out for mention any two or three from the splendid army of those who are successfully working along the lines so ably marked out by Pasteur and Koch. All this heritage, together with a goodly amount of purely academical work such as that lately done by Schaudinn and others, has fallen to the direct advantage of tropical medicine. Many excellent special publications in scientific medical journals, too, have added their quota, while such books on tropical diseases as those of Corre, Roux, Davidson, Scheube, Manson, Brault, and Mense point to methods which have resulted in the successful elucidation of many phases of the subject and large additions to the general knowledge of disease. Taking now some special instances: The demonstration of the method by which yellow fever is transmitted, which I have heard referred to (by one than whom our generation has produced no more distinguished exponent of the science of medicine) as "one of the most brilliant and conclusive investigations in the history of pathology," naturally occurs to me. The methods by which this was accomplished are familiar to us all and out of the reach of none. Ross's admirable work in India on the life history of the malarial *Hæmosporidium,* and the classical researches of Smith and Kilbourne

on Texas fever, are equally well known. The observations of Castellani and Bruce, Leishman, Dutton, Novy, Rogers, and others on trypanosomiasis in relation to sleeping sickness and kala-azar are models of their kind. The records of these and other equally meritorious achievements are open to us and point the way to further and even more fruitful effort.

Now a concluding word under this head as to the personal equation in the matter. As Sir Patrick Manson (who has well earned the title of Nestor of all tropical workers) has said, "the student of medicine must be a naturalist before he can hope to become a scientific epidemiologist or pathologist or a capable practitioner." Even the inestimable advantage of being on the ground in the midst of fresh material cannot confer the ability to observe accurately. Institutes of research like those, for example, in the Federated Malay States, Manila, and at Khartoum are steps in the right direction and worthy of all praise; but the earnest individual worker need not hastily despair. Granted the capacity for work and achievement, neither complicated apparatus, skilled assistants, nor unreasonable effort are necessary for the study of some of the most pressing problems which tropical pathogenesis is forcing to our notice. Most valuable information concerning some of these questions can be obtained by the expenditure of a little time, care, and patience on the observation of, for instance, the blood parasites of mammals other than man and of the Reptilia found in the torrid zone. In fine, a zeal for the acquisition of knowledge is a *sine qua non* which is well illustrated by the anecdote I once heard of Dr. C. W. Daniels, who was accustomed when in Africa to sit down under a tree, unpack his microscope, and carefully examine the blood of any one of his porters who chanced to fall sick on the march.

I come now to the scope presented by the study under discussion. This is a subject too large for more than a passing mention on this occasion. A few illustrative examples must likewise here suffice. It is not necessary to more than allude in this connection to the very incomplete state of our knowledge of the geographical distribution of disease. The epiphytic skin diseases of the tropics, the behavior of the ordinary bacteria in hot climates, the peculiar form which some cosmopolitan diseases assume in warm countries, all offer fruitful fields for investigation. The generally richer flora and fauna would lead us to expect greater diversity of noxious organisms than in temperate zones. The inexplicable absence of some diseases from the tropics presents no less interesting questions than do some distinctively tropical ailments the etiology of which is as yet shrouded in uncertainty.

Another subject of great moment is that of the intermediate hosts which subserve various parasites. For example, the life history and seasonal prevalence of but comparatively few mosquitoes and other blood-sucking Diptera have been observed. The hemophagous acarines and Rhynchota have never yet been adequately studied from this point of view. If I may be permitted a personal allusion, I might illustrate the foregoing remark by stating that of thirteen species of mosquitoes collected by me in a small district in West Africa, seven proved to be new to science; of eleven different biting-mouthed flies only one had been previously described; and the district was shown to rejoice in several new blood-sucking ticks. The largely systematic work of Theobald and Austen and the valuable bionomical observations of Howard, Giles, and Nuttall have hardly touched this immense and most important subject. On the other hand, not forgetting bacteriology, it may be said that while parasitology (as has been already pointed out) is perhaps the most important branch of tropical pathology, yet it is also the best worked, and the phytoparasites of warm climates offer

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now perhaps even a more inviting field for research.

In conclusion I can but hint at some special work that should immediately claim our attention. The completion of the investigation of the so-called Leishman-Donovan bodies; explanation of the puzzling dyscrasia in certain obscure fevers; observation of the new Maxwell-MacLean disease; critical examination of the suggested relation between ainhum and leprosy; further confirmation of the work done by Ross and Milne and the Liverpool School on "tick fever," and by Christy and Feldman on the intermediate host of *Filaria perstans;* a study of the quite neglected sarcosporidia and gregarines of the tropics (to say nothing of the special hygienic, surgical, and ophthalmological questions which specialists in hot climates have raised)—all these sufficiently indicate that the scope of tropical medicine is practically unlimited and the work still in its commencement.

A PLEA FOR THE MORE RATIONAL USE OF DIPHTHERIA ANTITOXIN.[1]

BY B. FRANKLIN ROYER, M.D., PHILADELPHIA,
Chief Resident Physician, Municipal Hospital.

My reason for selecting this topic for discussion is that from my work in the Municipal Hospital I am convinced that there are still in Philadelphia a number of physicians who do not use antitoxin in a rational way, and who use it without considering the probable amount of toxin being elaborated. Too often there is delay in giving diphtheria antitoxin until the infection becomes severe. Many times when the attack has been severe the dose bears no relation to the severity of the disease.

I purpose in this discussion to omit all of the technical and scientific terms usually employed to explain the processes involved in establishing immunity, and to omit those terms used to explain how antitoxic sera antidote the toxin of certain diseases. These processes have been often and well explained.

In this day and to this audience it is sufficient to say that the antitoxin of diphtheria perfectly antidotes the poison elaborated by the organism causing this disease. The point that some physicians are slow to grasp is that antitoxin will not antidote the toxins that were absorbed one, two, and three days before serum was injected. They do not fully realize that the diphtheria toxin, in probably four or six hours, will enter into a definite chemical combination with the body cells; combinations with affinities so strong that the antitoxin cannot break them up. They do not appreciate, while they procrastinate, that they are dealing with a chemical process which leads to degenerative conditions as certainly and as positively as if they delayed to antidote phosphorus while in the stomach. As soon as the patient has had enough toxin chemically combined with the cellular elements to produce postdiphtheric paralysis, just that soon has the time passed when antitoxin will prevent the oncoming paralysis. Six or eight hours or twenty-four hours earlier administration of antitoxin would have prevented it by antidoting the toxin when elaborated. All toxin absorbed can be antidoted from the time serum treatment is begun on through the disease.

Mortality statistics when compiled according to day of disease upon which serum treatment was begun prove this point more positively than any argument by words. In the Brook Hospital, London, Dr. McCombie has pub-

[1]Address by invitation to the Kensington Branch Philadelphia County Medical Society, Nov. 14, 1905.

lished such statistics for eight years; they are as follows:

	1897	1898	1899	1900	1901	1902	1903	1904
Of cases (204) treated on first day of disease the mortality per cent was	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Of cases (1278) treated on second day the mortality was	5.4	5.0	3.8	3.6	4.1	4.6	4.2	5.43
Of cases (1374) treated on third day the mortality was	11.5	14.3	12.2	6.7	11.9	10.5	17.6	10.63
Of cases (1086) treated on fourth day the mortality was	19.0	18.1	20.0	14.9	12.4	19.8	16.7	19.51
Of cases (1382) treated on fifth day and after	21.0	22.5	20.4	21.2	16.6	19.4	17.3	13.11

In the Municipal Hospital similar statistics were published in my last annual report to Dr. Abbott, chief of the Bureau of Health of Philadelphia:

MUNICIPAL HOSPITAL REPORT FOR 1904.

Day of Disease and Results.

Day of disease.	Admitted.	Died.	Per cent.
First day	43	0	00
Second day	220	9	4.09
Third day	153	21	13.72
Fourth day	114	20	17.54
Fifth day	61	9	14.75
Sixth day and over	121	18	14.87
Total	712	77	10.81

These statistics show that antitoxin should be given at once. Do not leave the house after diagnosing diphtheria without giving it. To await a later visit or to delay until the following day has cost thousands of lives.

It seems to me there are as good indications for dosage of diphtheria antitoxin as there are for digitalis or any other therapeutic remedy. A large amount of exudate calls for a large dose of antitoxin. A large amount of pseudomembrane means many thousands or millions of germs at work, a large amount of toxin elaborated and absorbed, and hence a great quantity of antidote required. The location of the lesion has something to do in determining dosage. The posterior nares, the superior pharynx, and uvula are underlaid with a network of lymphatics, all opened by the coagulation necrosis. In this location a larger proportion of toxin is thrown into the lymphatics, and directly into the blood, than in other situations. It is amazing to see the casts of pseudomembrane shed from the nares showing to the eye very little exudate. With the tonsil alone involved, particularly if the tonsil has been the site of repeated inflammation, the lymphatic supply is least efficient and absorption is correspondingly less rapid. Here, too, there is opportunity for a good portion of toxin to be swallowed and reach the circulation by way of the digestive apparatus. I might add that there is reason to believe that diphtheria toxin acted on by digestive fluids is less toxic. Perhaps chemical changes undergone in the stomach or intestines render the poison less harmful.

When exudate is present in the larynx or trachea we can only judge the extent of involvement by the stenosis. When the several sites are simultaneously involved very large doses are indicated. As antitoxin does no harm when given in larger doses than is required to antidote the poison, it is wise to give more units of serum than will be required than that the toxin should add more degenerative processes to those already started.

It has been our custom at the hospital to give a dose of antitoxin to every patient immediately after admission. The dosage followed is with a single tonsil involved 2500 units, both tonsils 5000 units, both tonsils with pillars or uvula 5000 to 7500 units, both nares and pharynx or larynx 7500 to 10,000 units. In each instance the dose is repeated in from twelve to twenty-four hours unless the exudate rapidly disappears. The succeeding doses are given in 24-hour intervals of the same size, or with a decreasing number of units, until the membrane has in good part disappeared. A careful study of nearly 2000 infections of all grades of diphtheria coming under treatment in all stages of the disease has convinced me that this is a rational procedure. I have seen patients saved by heroic dosage when death seemed inevitable. In my wards, where we often get neg-

lected cases with extreme nasal, faucial, and laryngeal involvement, we frequently give a total dosage of 30,000 to 50,000 units, or even 60,000 units, and fail to cure the patient, but success is more frequent than with smaller doses. We have not learned when the case is absolutely hopeless, therefore we give every patient the benefit of the doubt and antidote all toxin absorbed from the time we see the patient until he is cured or until death occurs.

There is another use for antitoxin that should be its greatest field. In addition to its antitoxic action it has powerful immunizing properties. We have not seen a patient contract diphtheria within three weeks after being immunized no matter what the degree of exposure. In the Municipal Hopsital, in three years over three hundred patients were admitted who did not have diphtheria. These were mothers with nursing babies, or babies with ill mothers, and patients with mistaken diagnoses. They were all immunized, and not a single individual contracted the disease. In striking contrast with this report is a single year's record of those whose work brought them in daily contact with the disease: thirteen of them contracted diphtheria, one, a resident physician, having two attacks. I do not believe that any patient immunized will contract the disease within three weeks, and many will remain immune for a month or longer. Second and third cases in a family at intervals of a few days should never occur if antitoxin has been given to protect those not already ill. Where the exposure has been but slight and of short duration 500 units is sufficient. If there has been maximum exposure, 1000 units is safe. Some germs may already have begun work in a site hidden from view. If any signs of illness are present in those exposed 1500 units is an appropriate dose.

It has been demonstrated that diphtheria antitoxin does all that is claimed for it as an antitoxic agent, and it immunizes perfectly against the disease. The dose should bear an appropriate relation to the amount of pseudomembrane and to its location. In certain cases 2500 units is sufficient for curative purposes, and in severe cases 10,000 units is not too much for a single dose. In immunizing it is rational to suspect a mild hidden infection, and give a dose large enough to immunize and to antidote some toxin if the germs are already at work.

MASTURBATION AMONG WOMEN.

BY WILLIAM LEE HOWARD, M.D., BALTIMORE, MD.

Rohleder[1] aptly quotes Stuart Mill's statement that the diseases of society can no more be checked or healed than those of the body without publicly speaking of them. Much has been said and written for and by medical men concerning the prevalence of masturbation among boys and youths, but its increase among women has not received the attention it deserves. It is also unfortunate that a practical knowledge of this vicious habit of modern civilization has not reached where it would do the most good.

I have said that this is a disease of modern civilization; but it is only deservedly so when we take into consideration its increasing frequency among unmarried women. The principal cause for this state of affairs is the sociologic conditions which make for the postponement and uncertainty of marriage. In savage races, where early marriage is the rule, masturbation is infrequent. Also, in our highly neurotic period it is undoubtedly true that sexual

[1]Die Masturbation. Eine Monographie für Aerzte und Pedagogen von Dr. Med. Herman Rohleder, Berlin, 1889, p. 319.

growth is rapid and markedly sensitive to suggestion and environment. The present-day literature for young women has simply a crust of attempted morality, its substance is suggestive of sexuality seasoned with false ideas of pure love. Those novels that are written by the modern woman all show an itching of the sexual center. The passion is all there, but perverted, unsatisfied, masturbatic. Of many that fortunately never get the light of publicity thrown on them I can testify that they all show mixoscopic ideation, are frequently the dregs of mental masturbation, and originate from one cause—unsatisfied sexual desires.

The present conditions under which we live are full of hypocrisy and inverted modesty, and what should be accepted as nature's first and sublimest laws have been ignored by uninformed teachers, timidly suppressed by mistaught mothers, and cowardly hidden by physicians, who bend under the yoke of social convention or rest in the lap of silence.

The habit of masturbation is as old as man, has been recognized as a degrading vice in all time and by all nations, savage and civilized, but it remained for our so-called civilization to ignore in school and church one of the most vicious and injurious habits that can destroy the manhood and womanhood of a nation. A few brave and scientific men in this country have tried to teach the prurient prudes the necessity of as complete a knowledge of the sexual organs as of the teeth or stomach, but their words of advice have mostly fallen on sterile soil, or else these advisers of mental and physical health would have been tabooed and considered men of filthy minds and worse morals. Much has, to be sure, been said by teachers on the moral side of unclean thoughts, but the fine points of morals and ethics do not appeal to the adolescent neuropath or the young woman with erethistic psychoses.

Prurient prudery and fear of looking nature fairly in the face and asking of her questions of vital importance to humanity, are some of the causes that have ruined the physical and mental health of many young women. As they were allowed to grow up ignorant of scientific knowledge of woman and her reproductive forces, and in some cases taught to despise these wonders of nature, as mothers themselves they still the tongue and stop the ears when their adolescent daughters, ignorant but not innocent, appeal in attitude and subtle hints for answers to the mind's vital questions. Such conditions inevitably result in change of character; for lack of candor and honesty forces a constant state of dissimulation, and the woman can never be true to herself. Dissimulation is the mother of lies, and as the mother is so will be the child.

I shall point out but few of the conditions surrounding the habit of masturbation in women. In institutions for defectives and in houses of correction (houses of corruption) we would expect this vice as well as other sexual perversions to be prevalent. My remarks do not refer to the class of girls in such institutions.

As Hall[1] says: "An irritable nervous system makes the richest soil for the habit of masturbation. The physical processes of first menstruation predispose to it. The factor that causes the greatest number of persons to practice it is too much psychic expression and not enough physical." Under this condition comes the mental masturbation of such psychopaths as Marie Bashkirtseff and Mary McLane. Long marriage engagements, during which the parties have seen much of each other alone, and finally break their relations, has been the cause in some of my cases. Such women have been under constant sexual excitement; when the disappointment comes the result is a great psychic shock, restraint no longer holds or controls them, and the culmination is a catharsis of passion which is certain to be

[1] "Adolescence," by Pres. Stanley Hall, Ph.D.

fed in an unnatural way. This is what Hall calls short-circuited sexual indulgence, because all the routes of approach, anticipation, embraces, and other natural stimuli to the secondary sexual organs have been jumped.

Whether or not masturbation is the cause of a distinct type of insanity I will not discuss here. Personally, I do not believe such is the case, especially in women, for in this sex the habit does not result in any marked deterioration or arrested development; for, as a rule, women do not masturbate until they have attained full maturity, many not until middle life. Also, it is not so injurious to their physical health, as in their sex nature sets no limits. The effect on the psychic life of the woman, however, is very great, and as we would expect, this effect depends upon the psychophysical soil on which the habit is planted. A neurotic woman has protean ways of expressing her sexual passion, and if it be not normally satisfied some morbid form of expression will be the result. In many of the cases coming under my observation it has not been a question of masturbation producing a distinct type of insanity, but whether it was not a type of psychic instability, or perhaps a chronic erethism in the cortex, that caused the masturbation.

I have stated that many women do not masturbate until they have reached middle life. In making this statement I do not forget the precocious child onanist or the schoolgirl who learns the habit before she learns its curse or disgusting psychic effects. In these latter cases there is not the vivid erotic mental pictures nor the feeling of a great gap in life's passionate song that is the principal psychic force in the woman masturbator.

There is not the same amount of unnatural sexual habits among boarding-school girls that formerly existed, although these practices are by no means expelled. A more rational method of teaching and a better understanding of personal hygiene have accomplished what preachers and moralists have never been able to do. Especially is this the case in boys' schools, and if the present craze for athletics has seemed to have driven out scholarship it has on the other hand saved many a boy from sexual debauchery and mental ruin. A boy with a broken leg from football has a far brighter outlook for future success in life than the coddled son of a mother who will not look physiologic facts in the face and learn that physical expression of activity is the only proper channel for the expenditure of youthful energy, and that this energy will be wasted in psychic expression along the line of sexual indulgence, masturbation when young and bashful, excessive natural indulgence when full-grown if the habit of masturbation has not made too deep a scar on the true sexual centers, and later on, when satiety and senility are approaching, will end in some form of the beastly perversions.

What I have said regarding athletics refers equally well to girls, but here I believe many errors have been made in overdoing the training and exercises. But this does not properly intrude itself here.

As evidence of the change of morals in schools and colleges the following trite admission is valuable:[1] "The tone of morals and the character of the habits of the students at the present time is far above—in real elements of excellence—the quality of the time of fifty years ago. There is less drinking and less of all forms of abominations now than in my day, and I believe a great deal is due, not to an increase of piety among the professors, but largely to the practice of the ball games of the present times, especially football, that it enables the boys to throw off an amount of steam and force and excitability and unmanly ways of a sad moral influence."

[1] A college professor who graduated fifty years ago. Quoted by Geo. Meyland, M.D., Medical Director of Gymnasium, Columbia University. New York *Times*, Aug. 12, 1905.

It is a sad commentary on the present madness for money when wide-awake principals of girls' boarding-schools dare not publish in the school catalogues the names of their scholars on account of the filthy she-wolves who mark their victims and send them not only pornographic literature, but artificial male organs that can be used mutually or secretly. There are men and women—*proximus ardet Ucalegon*—who get wealth by this vile and hellish business.

The permanent effects left from early masturbation seem to be much greater in woman than in man. As a rule, when the normally balanced youth gets his opportunity he ceases his habit and swings into the normal channel, and this is the end of his onanism. The conditions are different in the girl. As she grows, her psychic life becomes more complicated, her natural romantic nature is fed by kiss literature and poetry of the decadents, in which perverted passion is thinly disinfected by erotic mysticism. Under such a stimulating psychic pabulum a dormant sexual volcano may become active, and if it is only smoldering, suggestive dressing, the dance, and wine will soon bring about the complete explosion. At home in bed with strange and abnormal psychic pictures she will seek relief in masturbation. If this state of affairs is kept up for many years, when she marries her husband is certain to find he has for a wife a female who finds no pleasure in normal sexual intercourse, but an acquired pervert who will insist on some form of mutual masturbation. I have had many such cases in consultation, and they make up a large percentage of the causes for divorce.

One of the greatest incentives to self-abuse is the filthy meaning, but apparently innocent, advertisements that permeate the journals that are ostensibly published for women. Under the guise of "rubber goods," hygienic pads, and guides to happiness—God save the mark!—a mass of pornographic reading matter and hints of how to be happy, though unmarried, is poured into the homes of unsuspecting parents. These shameless and obscene suggestions all act injuriously on the woman with a teasing sexual appetite. In this matter the journals which so bravely took up the matter of patent and proprietary medicines and showed them to be concocted mostly of cheap alcohol and morphine have here a grand opportunity to benefit the public. Aside from the immoral effect these hidden aids to masturbation produce they have a decided mental effect, for it is undoubtedly true, as Spitzka and Clouston say, that these advertisements produce nearly as much insanity by their appeals to the sexual passions as self-abuse itself.

The Treatment of Follicular Tonsillitis.—

Sbrocchi (*Clin. Mod.,* No. 33, 1905) points out that there has been practically no improvement in the treatment of this affection by ordinary methods. The use of gargles is ineffectual, and commonly the disease pursues its course, without being materially altered by treatment. The disease invariably tends to spontaneous resolution. Systematic treatment of the tonsils should consist in carefully cleaning the crypts. This should be done with good illumination, so as to bring all the tonsillar surface into view. The whole surface of the tonsil, including a portion of the soft palate and the uvula, should be swabbed with a solution of 1-in-1000 corrosive sublimate. If this treatment is carried out at intervals of from two to four hours there will be found to be a prompt subsidence in the constitutional condition and improvement in the local conditions, excepting when there is a diphtheric infection. The latter calls for the prompt administration of antitoxin.

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BOOK REVIEWS.

THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA. Eighth Decennial Revision. Philadelphia: P. Blakiston's Son & Co., 1905.

The chief matters of interest in the present volume are the changes. The general principle of the Pharmacopœia is thus laid down: The standards of purity and strength prescribed in this Pharmacopœia are intended to apply to substances used solely for medicinal purposes, when professedly bought, sold, or dispensed as such. The attempt at dosage cannot be recognized as an advance, since, as the preface admits, the dose of a drug or preparation can never be regarded as a fixed quantity. The age and condition of a patient must always modify what is known as an average dose, but the doses which have been inserted are intended to furnish a guide to those who are inexperienced in prescribing, or who desire to use a drug or preparation with which they are unfamiliar. As the pharmacopœia is supposed to be a legal standard, action like this was decidedly inadvisable. Legal standards must take into account the legal principle of due diligence and the principle likewise of the common law, that any given factor involving guilt or innocence must be a matter of evidence directed on the hypothesis of innocence. The present dosage gives an unconscious but none the less potent aid to malpractice suits despite the limitations of the preface. If dosage were needed only for the inexperienced, it should not have found its way into a legal standard intended for use by physicians of average training. It is obvious from this that the present convention has had rather amateurish notions of the object of a pharmacopœia. This is clearly evident also in the dismissals from the Pharmacopœia. Some of the drugs dismissed are in continuously increasing use by the regular profession. There is no good reason why the old, tried kermes mineral should have been dropped. Quebracho still occurs to a great extent in the literature. The same is still more true of bryonia, caulophyllum, chenopodium, pulsatilla, and iris. The extended use of bryonia is evident in the fact that more than one manufacturer of pharmacopœial preparations has been obliged to make several preparations of the drug. The dismissals have obviously been made at the instance of pharmacologists accustomed only to the drugs prescribed in economic dispensaries of the East. The Pharmacopœia as a whole has too much of the *ex cathedra* quality to serve as a useful standard for the value of drugs and preparations. It can scarcely be said to have kept up with the level of previous Pharmacopœias. The necessities of practice in the different districts of the United States have not been studied as they should have been. The Latinity of the Pharmacopœia has received severe castigation, but rather undeservedly. Fluidextractum is not, it must be admitted, good Latinity, but fluidextractum is a loan word, and it is a universal philologic rule that loan words in inflection and meaning must follow the rules of the language which adopts them, not the language from which they are adopted. A word in common use illustrates this principle: gonorrhœa in Greek means a flow of semen, but the medical significance, not the Greek significance, is universally followed in English even in compounds. Thus gonococcus means anything but bacteria of semen, and gonotoxin means anything but a toxin of semen. The rules here followed apply to all loan words, and hence the castigation of the convention in regard to Latinity is undeserved.

THE URINE AND FECES IN DIAGNOSIS. By Otto Hensel, Ph.G., M.D., Richard Weil, A.M., M.D., and Smith Ely Jelliffe, M.D., Ph.G. Philadelphia and New York: Lea Bros. & Co., 1905. Price $2.75.

The authors have produced a practical and condensed handbook suitable for laboratory use and for the instruction of the physician, who needs a concise manual in the investigation of the urine and of the feces. The latter has been a much neglected field of medical research, a fact to which there has been frequent reference in these pages. The importance of intestinal parasites has led to a more frequent and systematic examination of the feces, and it is now beginning to dawn on the professional mind that valuable data may be obtained in the study of the digestive tract by examination of the discharges from the bowels. In this connection it is only necessary to mention two of recent observations, that known as the Gram-positive stool, and also the importance of slight traces of blood in the feces easily detected by the ordinary guaiac test. In the work before us the larger portion of that dealing with the examination of the feces, which by the way takes up one-half of the book, is devoted to a study of the bacteriological contents and a description of the animal parasites. As indicating what will prove to be the value of a study of the feces the authors say

"the digestive functions of the stomach may be said to exercise a very small influence on the character of the stool, inasmuch as even complete achylia gastrica scarcely modifies its character. Except for the digestion of connective tissue it would seem that the intestine is capable of vicariously replacing all the gastric digestive functions. It is far different when there is any interference of the functions of the liver, pancreas, or intestine. The alteration and absorption of fats, carbohydrates, and proteids are dependent on their proper and normal action, and in its absence these food elements appear in the feces often in large quantities. The diagnostic application of these data is unfortunately not as yet far advanced. Nevertheless the way has been definitely pointed to their value in medicine. Schmidt has shown the value of a test diet in the fermentative dyspepsias."

The section on the examination of the urine is complete, albeit the authors have reduced it to the narrowest limits consistent with the proper presentation of the subject. The work has been well issued and contains 116 engravings and ten colored plates.

ORGANOTHERAPY. By H. Batty Shaw, M.D., F.R.C.P. Chicago: W. T. Keener & Co., 1905. Price $1.75.

This work of 256 pages is an admirable statement of the present attitude of organotherapy. That this method has won a recognized place in therapeutics is now conceded, though as was to be expected the sensational claims of its overzealous followers have not been fully realized. The subject is not discussed wholly from a therapeutic standpoint, but anatomical details and a statement of the physiology of the principles involved are included. In the middle ages extracts from various organs were employed, but it was not until 1869 that the elucidation of the internal secretions was undertaken by Brown-Sequard. A great advance was made when it was found that myxedema, cretinism, and similar conditions which had received different names were found to be due to a defective elaboration in the thyroid gland. This was followed by thyroid medication, which has given us one of the most brilliant chapters in modern therapeutics. The chapter on thyroid and parathyroid glands is full and complete. In it, and indeed throughout the work, the writer expresses himself conservatively on the subject of organotherapy. In discussing ophthalmic goitre he says that the preparations from thyroidectomized animals have not yet secured an accredited place in therapeutics, but that further studies along these lines may give fruitful results. In the chapter on the suprarenal glands the disappointing results which followed substitution feeding are referred to. The discovery of adrenalin with its remarkable power of arresting hemorrhage, and its usefulness in certain blood states, is spoken of as an admirable compensatory result. The extracts of the glands of the alimentary tract, genito-urinary organs, and other tissues have not given results which were hoped for.

To those who are seeking a succinct and accurate account of the present position of organotherapy we would recommend this little book, which is of convenient size, bound in flexible covers, and gives practically all that is known up to this time on the subject of which it treats.

TEXT-BOOK OF PRACTICAL THERAPEUTICS. By Hobart Amory Hare, M.D., B.Sc. Eleventh Edition, Enlarged, Thoroughly Revised, and Largely Rewritten. Lea Bros. & Co., Philadelphia and New York, 1905. Price $4.00.

The simple, practical character of Hare's Therapeutics has made it one of the most popular books. In fifteen years it has reached its eleventh edition, the sale having been so rapid that in many instances the book had to be reprinted. This last revision brings it into line with the last edition of the Pharmacopœia. In his preface to the original edition the author stated that it was prepared with a view of articulating science and empiricism, the mixture of the two being hopelessly difficult for some, which often leads to the use of remedies without regard to what they are to do. The physician is often at a loss to know what remedy is indicated even when his theoretical knowledge is good. Ammonium chloride is a remedy to be used in bronchitis, but the exact stage at which it is to be employed is often not stated. Digitalis is likewise said to be useful in cases of cardiac disease, but it is not stated that it is only useful when compensation is lacking. To meet this the writer has devoted the last division of the book to applied therapeutics. One of the most important chapters is that dealing with remedial measures other than drugs and with foods for the sick. The practical and simple directions in this portion of the volume will especially appeal to the active practitioner.

A work that has been so long before the profession and so well received scarcely needs commendation at our hands. The three sentences which face the title-page should be in the minds of every one who prescribes drugs:

"When called to guide a patient through an illness the physician should be constantly a watchman, and a therapeutist only when necessity arises."

"A good physician is one who having pure drugs knows when to use them, how to use them, and, equally important, when not to use them."

"When a physician gives a drug and the patient improves, care should be taken not to ascribe all the good results to the remedy employed. Nature must be given credit for a large part of the improvement."

THE BLUES (SPLANCHNIC NEURASTHENIA). Cause and Cure. By Albert Abrams, A.M., M.D. Second Edition. New York: E. B. Treat & Co. Price $1.50.

In June, 1904, we reviewed the first edition of Abrams's work, and we closed with the statement that we were impressed with his view of abdominal stagnation in the development of neurasthenia, and of the value of overcoming it by physical methods. The second edition is an elaboration of the same ideas. The central thought of the writer is that the upright position of man has brought undue tension upon the abdominal vessels. Want of exercise, unsuitable clothing, and a sedentary life lead to a relaxation of the abdominal muscles and overfilling of the veins and consequent stagnation, disturbance of digestion, and an attack of "the blues," or of one variety of neurasthenia. He does not refer all neurasthenia to this condition, but believes that it may be recognized as a cause of many conditions by careful examination of the abdomen, which will reveal gaseous distention, weak muscles, and consequently a weakened diaphragm. To meet these conditions he has devised an abdominal exerciser, consisting of four elastic cords which are adjusted in such a way that a patient may breathe against their elastic force, in this way exercising the abdominal muscles. The second edition is a further elaboration of these ideas, the author being encouraged by the fact that the first book met with a favorable reception. We can only repeat what we said regarding the former edition, that while one may not be prepared to accept all that the writer asserts, there is much that is original and suggestive in the writer's claims.

SURGICAL DIAGNOSIS. By Albert A. Berg, M.D. Lea Brothers & Co., New York and Philadelphia, 1905. Price $3.25.

Various works in the surgical specialties have been evolved, and monographs on surgical topics such as hernia, abdominal surgery, operations, tumors, and surgical pathology are by no means infrequent. To this collection we now have added a work on surgical diagnosis. The *raison d'être* is stated in the author's preface to be due to an appreciation of the fact that formerly the surgeons' efforts were limited to organs lying on the surface and directly accessible. Improvements in operative methods and technique have brought the internal organs within the range of successful treatment, and this enlargement of the surgical field has necessitated the introduction of new methods of diagnosis and improvements upon the old. The writer has endeavored to bring together the investigations of the laboratory and clinical observations and to focus them upon surgical maladies. The method followed is to first give a concise clinical picture of each disease, including its cause, onset, and course, and in certain cases the accompanying pathological changes. Then the points of difference between the disease under discussion and other diseases for which it might be mistaken are stated. The author has produced an admirable book, one which will be welcomed by students of surgery as presenting in a succinct and admirable manner the symptomatology of surgical affections. The work is splendidly illustrated, containing 215 engravings and 21 plates.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M.D., Assisted by H. R. M. Landis, M.D. Vol. 4, December, 1905. Lea Brothers & Co. Price $6.00 per annum.

The December issue of Progressive Medicine forms a volume of 367 pages. It includes the diseases of the digestive tract by Steele; genito-urinary diseases by Belfield; diseases of the kidneys by Bradford; anesthetics, fractures, and the surgery of the extremities by Bloodgood; and a therapeutic referendum by Landis. One of the most important papers is that on benign and malignant tumors of the extremities, this topic having been introduced in the Year-book in 1899. It is illustrated with a number of excellent plates showing sarcoma of the skin and bone. In the therapeutic referendum Landis discusses the eighth decennial revision of the Pharmacopœia, and goes extensively into the use of various sera, which he thinks will have their greatest use in prophylaxis rather than in treatment. The recent paper of Llewellyn on the use of acetozone in typhoid fever is abstracted. Kyle has also found this substance useful in affections of the trachea, and Ford has used it in general surgery and in the treatment of fistulous tracts and suppurative conditions.

A MANUAL OF THE DISEASES OF INFANTS AND CHILDREN. By John Ruhräh, M.D., Clinical Professor of Diseases of Children in the College of Physicians and Surgeons, Baltimore. Philadelphia and London: W. B. Saunders & Co., 1905. Price $2.00.

The writer has compressed the subject of pediatrics into a volume of 404 pages for the use of students. He says that it is not his intention to supplant the larger text-books, but to give the student a volume in which he can review the subject in outline without at the same time finding any serious omissions. The work has been compiled from the standard text-books on pediatrics and also from journal articles. A considerable number of references to journal articles are found as foot-notes, and the student is further instructed in

more extensive reading by a short chapter on pediatric literature, which contains an account of how different subjects may be looked up. The author has done his work well, having condensed a large subject into reasonable proportions without any serious omissions. The work is well printed in large, readable type, and is well illustrated. It is bound in flexible covers, which especially adapts it for classroom and bedside instruction.

YEAR-BOOK OF LEGISLATION, 1904. Edited by Robert H. Whitten, and published by the New York State Education Department. Albany, 1905. Price $1.00.

This volume, published by Melvil Dewey, Director of the New York State Library, is an exceedingly valuable contribution to sociological literature, giving as it does the trend of legislation in all portions of the United States. There is first a digest of the Governor's messages of 1904, which is followed by a summary and index of legislation, and then a review of legislation for the same year. The legislation that will be of most interest to physicians is that relating to the feeble-minded and epileptics, the insane, and charities and correction. In a very considerable number of States the care and protection of dependent and delinquent children received the attention of the legislatures. In some departments, notably of charities, it is stated that the volume of legislation during 1904 was less than in some other recent years. There has been considerable alteration in the definition of crimes and in degree of punishment, but no new offenses have been discovered.

TREATISE ON DISEASES OF THE SKIN. By Henry W. Stelwagon, M.D., Ph.D. Fourth Edition. Philadelphia and London: W. B. Saunders & Co., 1905.

The fourth edition of Stelwagon's magnificent treatise on diseases of the skin will be welcomed by those who are in general practice and yet desire a work that will give them a comprehensive view of this important department of medicine. In preparing the work the writer has never lost sight of the fact that a text-book is intended to stand in the place of a teacher, so that symptoms and elementary matters are presented in the fulness of detail that will enable the beginner to grasp their importance and to apply them in the treatment of disease. This last edition has been carefully revised with especial reference to the newer methods of treatment, such as the Roentgen ray, high-frequency currents, and the Finsen phototherapy. Notwithstanding a very thorough revision and additions the writer has not increased materially the size of the present edition. The work is adequately illustrated, containing 258 figures and 32 full-page lithographic and half-tone plates.

A MANUAL OF DISEASES OF THE NOSE AND THROAT. By Cornelius Godfrey Coakley. Third Edition. Lea Brothers & Co., New York and Philadelphia, 1905.

This belongs to the smaller works on diseases of the throat, notwithstanding that it has 594 pages, and deserves to rank as a treatise. In this latest revision the author has found it necessary to rewrite the portion of the work dealing with the accessory sinuses. The original purpose of the work, to provide a compact manual answering the needs of both students and practitioners, has been kept in mind. Throughout the work in dealing with treatment the writer describes those methods which have been successful in his own hands. In addition there is a chapter on therapeutics, in which the more frequently used solutions, powders, and other remedies employed in nose and throat work are described.

ANATOMY AND PHYSIOLOGY FOR NURSES. By Le Roy Lewis, M.D. Philadelphia and London: W. B. Saunders & Co., 1905. Price $1.75.

Among the numerous text-books for nurses which have recently appeared there are none which deal especially with anatomy and physiology that are adapted to the student nurse. The author has condensed both subjects into a narrow compass, using plain language and numerous illustrations. He has produced an excellent epitome of physiology and anatomy, giving the essential points with which a nurse should be acquainted.

ABSTRACTS.

THERAPEUTICS.

Recent Views on the Therapeutic Value of Alcohol.—

BLACKADER, A. D. *Montreal Medical Journal,* vol. xxxiv, No. 11, p. 811, November, 1905.

The recent wholesale condemnation of alcohol in therapeutics does not wholly meet the views of the writer, who refers to the fact that it was long recognized as of considerable value by an array of the most careful clinical observers. He, like many others, was taught to regard alcohol as a rapidly diffusible stimulant affecting both heart and nervous centers. The modern indictment of alcohol charges that it does not stimulate the heart nor raise blood-pressure. It is not a stimulant but a depressant and narcotic, of no value as an antipyretic, and it lessens the natural protective powers against infection and increases the tendency to bacterial invasion. It has no food value, and its continued employment disturbs metabolism and favors the retention of waste products.

Recent careful experimental work shows that alcohol in moderate doses does not increase the efficiency of the heart's action. There is a slight transitory action on the heart muscle which passes off quickly and gives rise to subsequent depression. Alcohol produces a dilatation of the superficial arteries with some evidence of constriction of the vessels in the interior of the body. Blood-pressure is not raised. A large toxic dose acts as a direct depressant to the heart muscle and to the arterial system, and produces a notable fall in blood-pressure, and this is true in cases of disease in which the patients are in bed and the conditions not varied. The work of Crile shows that alcohol has no effect on the circulation so far as can be judged by the pulse and blood-pressure either of normal animals or those in a state of shock. It also has no effect on the respiratory system.

The effect of alcohol on the nervous system is one of apparent stimulation. Cushny illustrates the character of this action as follows: A person observing a sudden increase in the speed of an engine may attribute the increase to more steam on the piston, but it may be due to removal of the brakes. This apparent stimulation is rarely seen in the sick. Alcohol is a nervous depressant, manifesting itself first on the highest and last acquired centers of judgment, discrimination, and self-control. Kraepelin has shown that alcohol does not increase either the mental functions or the activity of motor centers of the brain or cord. On the contrary it lessens their capacity for work even when the doses are small, and with full doses the benumbing effect is very prominent.

This in the opinion of the writer points to the true therapeutic use of alcohol. If it were a cerebral stimulant it could seldom be employed to advantage in medicine, especially in acute disease, in which the great object is to secure rest for irritated nerves.

Lavish use of spirits in every form of bacterial invasion is probably harmful. As a food it has some value, and in the writer's opinion it is serviceable in conditions of exhaustion. It is a food that requires no digestion, but is promptly absorbed from the stomach, and it may be of inestimable value in cases of diminished or altered secretion associated with pyrexia and profound exhaustion. It must be borne in mind that the effects of alcohol vary in different individuals, and its action on the stomach is to some extent dependent upon the variable conditions of the gastric mucous mem-

brane and portal circulation. In conclusion the writer says: (1) Alcohol is not an efficient cardiac or respiratory stimulant, but when administered in frequently repeated small doses its action on the circulation may be regarded as favorable. In some conditions with a determination of blood to the interior of the body, as indicated by cold extremities, livid skin, small pulse, scanty urine, and a high rectal temperature, a condition which has been described as bleeding into the splanchnic area, the administration of alcohol by dilating the superficial vessels and equalizing the circulation may be of considerable service. Alcohol may be of value when given to counteract the action of the peripheral vessels in the chill or rigor often associated with the onset of disease. (2) Alcohol is not a stimulant to the nervous system. Its action is that of a narcotic, benumbing sensation, including that of fatigue, allaying subjective symptoms, relieving nervous strain, and promoting rest. No other narcotic can be used so freely with so few injurious by-effects. (3) Alcohol in disease is a valuable food, replacing carbohydrates, and as a general rule saving proteid metabolism. It places no tax on the digestive organs; on the contrary, if used intelligently it increases their secretion, and in asthenic conditions it assists the digestion and favors absorption of other foods.

Mental Therapeutics.—

SPRINGTHORPE, J. W. *Lancet,* vol. clxix, No. 21 of vol ii, p. 1469, Nov. 18, 1905.

To secure the *mens sana in corpore sano* the physician is pledged to a recognition of mind and matter as the fundamental entities, and he should possess some clear understanding of their relationship and interactions. Neither medical education nor clinical training as ordinarily experienced is calculated to give the average medical man an adequate idea of the part played in health and disease by the psychical factor. As a result the profession is generally unconcerned or even ignorant as to its true position and therapeutic application. The systematic utilization of the psychical factor in the maintenance of health and the cure of disease constitutes mental therapeutics. Contentment has always been recognized as a valuable possession. It is recognized that joy stimulates, fear depresses, worry disturbs, and fright acts like a shock. The physician with his hygienic, dietetic, and medicinal measures influences the mind, but the attempts are sporadic, often automatic, and hardly deserve the name of mental therapeutics. To do this the aim should be to systematically arouse all the powers of autosuggestion. This means that the psychological moment shall be grasped and the most appropriate suggestion applied. The psychical methods of treatment alone are not sufficient, but to omit them is to leave out one of the most important methods of placing a patient on the road to health. The value of suggestion has long been recognized in the domain of mental diseases, but it must be combined with such dietetic and medicinal measures as are available in a good hospital. A common error is to ignore the psychical factor in the diagnosis and treatment of every-day disease. The physician who makes even a minimum effort in the direction of suggestion will often do more for his patient than a more highly qualified confrère who makes none. To some the power of suggestion naturally comes without conscious search and improves with experience, but in some measure it may be acquired by all.

The writer closes his paper with the statement that while the public are ignorant and credulous and misguided, and quackery is fraught with such untold waste and innumerable failures, the profession owes it not only to itself and to individual patients but to the community at large to lose no time in plac-

ing mental therapeutics among the essentials of its every-day treatment. For its legitimate cultivation and systematic use there are required only a clear recognition of its limitation, absolute honesty in its application, and the unfailing observance of ethical traditions.

Active Treatment of Muscular Rheumatism.—

CATES, B. B. *Boston Medical and Surgical Journal*, vol. cliii, No. 18, p. 493, Nov. 2, 1905.

The writer is not altogether sure of the causes of muscular rheumatism, whether it is due to the fatuous "uric acid diathesis" or results from improper clothing, exposure, or sitting in damp clothing. One thing is certain, that most of these patients have a coated tongue, offensive breath, constipation, and frequently suffer from headaches. They are often heavy eaters and chew their food imperfectly. In such cases antirheumatics do little good, drugs generally being of little use. The condition is one that calls for mechanical therapeutics. The proper way to treat the cases is by exercise of the affected muscles. For this purpose Indian clubs are better than dumbbells, as they give a better swing to the muscles and the exercise is more gentle and natural. The clubs should be light, and the best time for the exercise is on getting up in the morning. The duration of the exercises should be from ten to fifteen minutes. After the exercise a plunge into a bath-tub of cold water and a vigorous rubbing should be followed by a glow on the skin. Attention should be given to the proper mastication of the food, and if there are any defects in the teeth they should be corrected.

The patient should be taught to use the clubs in such a way as to exercise the offending muscles. In muscular rheumatism of the shoulders, lumbago, and sciatica, the patient should stand holding the clubs with the feet widely apart; then the entire weight of the body should be thrown on the right leg, the face following the direction of the clubs, at the same time extending the clubs far to the right and above the head; now the patient may without changing his position let the clubs fall backward over his shoulder, and in so doing act powerfully on the deltoid and scapular muscles. Still holding the clubs in this position, by dropping the shoulders with the clubs pointing downward and backward act also on the pectoral muscles, the weight of the clubs drawing the shoulders backward. Then bring the clubs down in front in a broad sweep toward the floor; shift to the left foot. These slow and measured movements at the side are kept up for two or three minutes. In the same position, feet apart, the face is turned to the right with the arms extended above the head. Then a profound salaam is made, bringing the clubs to the floor; then rising to the erect position the head and body are thrown as far back as possible, at the same time bringing the clubs back over the shoulder in a broad sweep to the rear. These upward and backward movements of the arms exercise the deltoids and scapular muscles. They should be repeated for two or three minutes; then face to the front and repeat the right lateral movements for two or three minutes; then face to the left and repeat the right and front movements. In this way all the muscles at fault as well as those not offending are exercised equally. This time lay aside one club and swing with right hand from right to left in broad sweep, in front reaching as far as the arm will go, but swaying from one lower limb to the other. With each swing incline the body slightly forward. Let the body and face follow the movement of the arm. Repeat this movement for two minutes. Take the club in the left hand and repeat the same movements for two minutes. Without changing the position, the face looking straight ahead, with right hand bring the club in a broad sweep down in front, at the same time bending the body far toward the

floor; then assume the exaggerated erect position with head thrown back, and as you do so bring the arm in a broad sweep over the shoulder toward the rear; repeat these movements for two minutes. Then shift the club to the left hand and repeat these same movements for two minutes. In other words, one exaggerates the movements the blacksmith assumes when with a heavy hammer he strikes the iron at white heat. In sciatica the thighs should be alternately flexed on the abdomen forcibly, and the exercise continued for two or three minutes.

Treatment of Syphilis by Intramuscular Injection of Mercury.—

LAMBKIN, F. J. *British Medical Journal,* p. 1254, Nov. 11, 1905.

The writer's experience is based on 2330 cases. He refers to the improvement in the management of syphilis, due, as he thinks, to the recognition of the necessity for a continuous treatment over a considerable period of time. He believes that the administration of mercury in pill form or the use of inunctions two or three times a week is not nearly as efficient as intramuscular injections. To the latter must be given the main credit for improvement in the management of syphilis. This method was introduced in the British army in 1888. At first it met with opposition, but it has gradually won its way into favor until it has been recognized as the best and most convenient means of carrying out the continuous treatment. The alleged dangers of intramuscular injections have been greatly exaggerated. The writer has employed over 60,000 injections of mercury, mostly in the metallic form, and in not one of these was there abscess or emboli. It is most important that every detail in connection with the injections should be carefully carried out. The soluble salts of mercury have been used extensively by the injection method, but they require to be repeated three or four times a week, which is not only distressing to the patient but irksome to the surgeon. The advantage of the soluble salts is that their action can be better controlled than the insoluble salts. Calomel is absorbed very quickly and prompt reaction follows its injection, more so than after any other salt of mercury. Its injection is intensely painful, and it should be used only in cases in which heroic measures are necessary. The writer has made extensive experiments with the salicylate of mercury, and has found that it is not as useful as either calomel or metallic mercury. To obtain marked benefit from it it should be injected at least two or three times a week.

The most satisfactory mercurial preparation is metallic mercury rubbed up with lanolin so as to form a cream. A good formula is as follows: Mercury one-half ounce; lanolin two ounces; liquid paraffin, carbolized (two per cent), to make five ounces by volume. The finished product equals one grain of mercury to ten minims. The dose is ten minims once a week. Metallic mercury is not quite as active as calomel, but for the majority of cases it is sufficient and the injections are practically painless. In compounding the cream the mercury and lanolin ought to be rubbed thoroughly in a glass mortar until every particle of the mercury disappears. This trituration is tiresome and ordinarily takes two hours. When the whole amount has been treated the carbolized liquid paraffin is added. The injections are preferably made in the gluteal region, the needle being driven straight into the muscle with one thrust. Glass syringes should be used with a platino-iridium needle, the latter not exceeding 1⅛ inches in length. The average dose is one minim of metallic mercury, though this will be found insufficient for some cases and too much for others. The injections should be given once a week for six weeks or two months. The frequency is then reduced

to once in two weeks for the next three months. A rest from all mercurial treatment for two months should be followed by a three-months' course of fortnightly injections, to be succeeded by a two-months' repose from treatment. In this way the patient is brought to the end of the first year's treatment. After this he is kept under strict observation, and should he show any signs of relapse further courses of three-months' treatment are given, followed by the same amount of rest. The patient ought not to be lost sight of until he has been at least three months clear of all symptoms after the last course of injections.

Recovery from Diabetic Coma under Alkaline Treatment.—

SEARS, G. G. *Boston Medical and Surgical Journal,* vol. cliii, No. 22, p. 600, Nov. 30, 1905.

The alkaline treatment of diabetic coma is theoretically sound, but the number of cases reported in the literature in which recovery has followed the administration of alkalies is only sixteen, an abstract of which is given. The cases include all grades of coma, and are accepted on the authority of the reporters. The diagnosis does not appear to have been established in a number of instances. In some cases the histories do not harmonize with the usual symptoms of true diabetic coma. The diagnosis of threatened coma is not always easy. Disturbances of digestion and general depression may precede its onset, but it is not a necessary sequence, and recovery from such conditions has not infrequently occurred spontaneously. The alkaline treatment is certainly a remedy for diabetic coma, as acid intoxication is its cause. The proper administration of alkalies will sometimes indefinitely postpone the onset of coma, and it will occasionally arrest its progress at the beginning, and in some rare cases rescue a patient from its fully developed stages. The alkalies are purely symptomatic remedies which combat effects and not causes. They can only be of use before changes in the tissues have occurred. Acting as a chemical antidote, it is necessary that the dose of alkalies should be sufficient to neutralize the offending acids. The greater success reached in the treatment of children is probably due to the larger amount of alkali employed. Various routes have been employed for the introduction of alkaline solution, and all have been followed by successes. Hypodermic injections are usually followed by suppuration and necrosis. The intravenous route is free from this danger, and its stimulant effect may be of great advantage.

The patient observed by the writer was 13 years old, and he had been under observation for four months, during which time he had suffered from excessive hunger and thirst and had passed large quantities of urine. His strength had steadily failed, and the weight had fallen from 79 to 55 pounds. At the time he was admitted to the hospital he was semicomatose. The breath smelt strongly of acetone, the skin was harsh and branny, with a purpuric eruption. The extremities were cold and cyanotic. The pulse was rapid and barely perceptible, the temperature 99°. The pupils were dilated but reacted to light. The urine contained 5.3 per cent of sugar and a trace of albumin. Acetone and diacetic acid were present. Directly after his admission he was given eight ounces of sterile salt solution, in which bicarbonate of soda was dissolved almost to the point of saturation, under the skin of each breast. An unsuccessful effort was made to give the alkaline solution by the bowels. A heaping teaspoonful was added to a tumbler of water and was given by the mouth to the limit of the patient's capacity. No record of the amount was kept, but as thirst was great large quantities were taken. The stupor rapidly decreased, but the patient was drowsy for several days. Convalescence was interrupted by uremic convulsions, which were accompan-

ied by a marked diminution in the quantity of the urine. In spite of the large doses of alkali the urine remained persistently acid throughout the patient's stay in the hospital. The sugar varied from one to three per cent under a diet which contained a little bread and considerable quantities of milk. Acetone was more frequently present in the urine than absent, but its odor persisted only a few days after entrance. Suppuration occurred at the site of the hypodermic injections. The abscesses were long in healing.

The X-rays in the Treatment of Cancer.—

WILLIAMS, C. *Lancet,* clxix, No. 19 of vol. ii, p. 1318, Nov. 4, 1905.

The writer gives a number of histories in which the *x*-ray treatment has exercised a favorable influence upon the progress of cancer, and he is of the opinion that in the treatment of malignant growths the *x*-rays are of distinct value. In the past there have been many failures; but in part this was due to imperfect apparatus and a want of knowledge of the effects that could be produced. Another cause of failure is due to the fact that patients are sent to the *x*-ray operator after nothing could be done surgically. Some patients will not persevere in the treatment in consequence of their feeling better and looking much better. Another cause of failure is too energetic treatment, particularly in the earlier cases, by which the surrounding tissues are lessened in resistance and the growth in consequence advances more rapidly than it otherwise would. In the writer's opinion it is not good practice to shield the surrounding area in most cases, but a layer of dry lint which is transparent to the rays placed over the part lessens the tendency to dermatitis. Broadly speaking, the more recent the growth the greater the chance of a favorable result. Cancerous ulcerations, primary or secondary, can be made to heal very rapidly. Cases of sarcoma often disappear, especially recent sarcomatous growths in the young. The *x*-rays should be used in all cancerous cases before operation, just as they should be after operation to prevent recurrence. The writer's cases have nearly all been operated upon, and the disease recurred.

The best cases for the *x*-rays are those in which the disease is strictly local, as in epithelioma of the lip, which has recurred in the scar in the shape of small lumps with the glands not largely affected. Even in primary cases, where the patient from age or other cause refuses operation, much may be effected by *x*-ray treatment. In nearly all patients pain can be alleviated and reduced to a bearable quantity even when the growth is extensive. The *x*-ray should be employed as soon as the diagnosis is made, whether the case is operated or not; also after the operation, directly the scar is healed, or even before that time if it shows the slightest appearance of being sluggish in the healing. A nodule the size of a pea should have immediate treatment whether in the scar or not; this requires for its proper fulfilment constant observation by the medical attendant. Every such case should be seen as often as once a week.

Advanced Mammary Cancer Treated by a Combination of Operations and the X-rays.—

JONES, H. L. *Lancet,* vol, clxix, No. 21 of vol. ii, p. 1464, Nov. 18, 1905.

The patient in July, 1904, consulted for a steadily growing tumor of the right breast which had been observed twelve months before. The tumor had the usual appearance of an ordinary carcinoma. It was large, hard, and heavy, the nipple was retracted, and the skin was involved, the glands being enlarged under the axilla. The axillary lymphatic glands and tissues were cleared away and the lower portion of the pectoral muscle removed, so much skin being taken away that the wound could not be united. In November recurrence took

place in the form of numerous nodules scattered about the intercostal spaces. On November 11 eight or ten of these small growths were removed. January 12, 1905, another operation was performed, six nodules being taken away on this occasion, and in March six additional were removed. In April, 1905, the local conditions were unfavorable; numerous nodules could be felt though not seen, and the case had become inoperable.

The *x*-ray treatment was begun April 11. For two months the irradiations were given twice a week. Since then there has been only one application weekly. Within three weeks from the commencement of the *x*-rays the general condition of the patient improved. A number of the nodules disappeared. The *x*-ray applications were used for twelve minutes, the tube being soft or of medium hardness and the current from 0.5 to 0.8 milliampere. There was no dermatitis and very little pigmentation. There was no screening of the surrounding parts beyond protection of the face and parts of the arm and forearm. On October 17 the patient had improved very much and was able to walk five or six miles without fatigue. There was no sign of carcinoma in the form of nodules; no involvement of the edges of the scars. There was no glandular enlargement in the neck or elsewhere.

The Quick Curative Treatment of Gonorrhea.—

LYONS, F. A. *Medical Record,* vol. lxvii, No. 19, p. 731, Nov. 4, 1905.

This is a report of a series of 400 cases of acute gonorrhea treated during the last ten years, in 384 of which—that is, 95 per cent—the disease was cured in six days, and in about 80 per cent in twenty-four hours. The method consists of an injection into the urethra of one drachm and one-half of four-per-cent nitrate of silver solution. Later a two-per-cent solution is employed, and then a one-per-cent. In most cases a single injection was sufficient. It produced little pain and the gonococci disappeared from the secretion. If they were still found the injection was repeated. When not cured by three injections the treatment was not continued. The method depends for its effect on the fact that early in the disease the gonococci lie upon the outer layer of epithelial cells, multiplying on them, destroying their vitality and causing them to exfoliate. At this stage the microscope shows many gonococci on the epithelial cells; there follow congestion, afflux of serum, exfoliation of all the epithelium until the subepithelial tissue is laid bare. There is now in the discharge few epithelial cells and many pus cells. At this time the gonococci penetrate the connective tissues. As long as there appear under the microscope epithelial cells studded with gonococci so long are the germs within reach of the germicide, and the case is amenable to quick treatment. The exfoliation of the epithelium is only hastened by the silver nitrate, and hence does no harm.

Nux Vomica in Hyperchlorhydria.—

MUSSER, J. H. *Therapeutic Gazette,* vol. xxi, No. 11, p. 721, Nov. 15, 1905.

The writer as early as 1885 pointed out the value of nux vomica in stomachic affections, and showed that it was important to increase the dose beyond that usually given until the physiological effects of the drug were apparent, such as slight headache or vertigo, with perhaps some muscular rigidity. Practically from 30 to 50 drops is the average amount which can be taken in old subjects, and in those under 50 from 40 to 80 drops. The initial dose should be small, the dose being increased to the point of tolerance, this furnishing the best results. The drug is most useful in the asthenic cases, those that are underfed and underweight and suffer from the local and general fatigue symptoms. A similar treatment the writer has found useful in hyperchlorhydria, particularly in those cases which were not relieved by sed-

atives—in short, where the hyperchlorhydria does not result from a local irritating lesion, but is the expression of a gastric neurosis due to the persistence of general atony or anemia. The patients without obvious gastritis or ulcer generally bear the stigmata of an exhaustive neurosis, and they are thin and weak and often hypochondriacal. They may have suffered from uterine or ovarian disease, and often show signs of gastroenteroptosis. They are usually constipated. It is in this class of cases that the best response is obtained from the action of increasing doses of nux vomica.

Treatment and Care of Advanced Cases of Pulmonary Tuberculosis.—

KNOPF, S. A. *Medical Record,* vol. lxviii, No. 21, p. 805, Nov. 18, 1905.

The advanced cases are divided into ambulant and bed cases. The former are those which are most of the time without fever, and in which the systemic disturbances are only a little more aggravated than in the early stage. These may be treated as incipient, with the one exception that if there is not a satisfactory gain in weight they should be put at rest in bed or on a reclining chair, constantly exposed to the open air. The ambulant cases are the most frequent sources of infection, and the greatest care must be taken to train them to dispose of their sputum properly. Several plans for accomplishing this are described. The bed cases are subdivided into four classes, namely, sanatorium patients, hospital patients, home patients—well-to-do, living either in cities or country—and the consumptive poor, living in villages or in city tenements. It is a matter of great difficulty to find proper accommodations for such patients, as sanatoria are usually unwilling to receive cases that do not offer a favorable prognosis. The author outlines the essentials for the institutional treatment of such patients, and then describes a great number of plans for applying the fresh-air principle in home treatment. One of the most serviceable of these, especially in dealing with the poor in cities, is a device invented by the author, and known as the window tent. The patient lies on a cot with his head beside the open window, to which is attached a sort of internal awning. This is arranged so that it shuts off the patient's head from the interior of the room, and permits the latter to be kept warm, while the effect is the same as if the patient were entirely out-of-doors. The plan has many advantages, both from the practical and from the medical standpoint. Other devices that are commended are Dr. Bull's aerarium, and Dr. Kellogg's porte d'air. These are intended to serve the same purpose of permitting the patient to remain indoors, while at the same time he is enabled to receive fresh air as freely as if he were not in the house.

The closing portion of the long and profusely illustrated paper is devoted to a consideration of the other hygienic and medicinal factors that must enter into the treatment, and many practical points are discussed, for which reference must be made to the original.

Tryon, N. C., as a Climatic Resort.—

GARRIGUES, H. J. *Medical Record,* vol. lxviii, No. 22, p. 860, Nov. 25, 1905.

The writer praises this place highly as a resort for rheumatic and gouty people, convalescents after serious diseases or operations, anemic persons, those who suffer from a broken-down nervous system, or those affected with tuberculosis, heart disease, or any ailment of the respiratory tract. Tryon is situated in the western part of North Carolina, at the foot of the steep slope forming the connection between the mountainous region and the lowland, slightly above the 35th degree of north latitude, at an altitude varying from 1000 to 1200 feet above sea level, and about 250 miles from the Atlantic. The weather is mild and dry, without extremes of temperature, winter

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or summer, and the author believes it is the best all-year-round climate in the United States. The annual number of sunny days is very large, drainage is perfect, and mosquitoes are rare. It can be reached from New York in twenty-five hours, with one change of cars.

Alypin, a New Local Anesthetic.—

STEPHENSON, S. *The Ophthalmoscope,* vol. iii, No. 11, p. 547, November, 1905.

Alypin is a white crystalline neutral powder, very soluble in water, recently introduced by Bayer & Co. It is not precipitated by alkaline fluids, and its properties are not impaired by boiling for ten minutes. Its anesthetic effects are equal to those of cocaine. A one-per-cent solution produces deep anesthesia of the rabbit's cornea in fifty or sixty seconds. The lethal dose in dogs and cats is about double that of cocaine. It is relatively non-toxic and is a pure local anesthetic. The writer has used it in a two-per-cent watery solution, giving it several hundred trials. When dropped into the conjunctival sac there is a slight smarting, but not so much as is noted with cocaine. In about seventy seconds the conjunctiva together with the cornea is insensitive to touch. A few seconds later the ocular conjunctiva may be seized with fixation forceps without the patient experiencing the least pain. There is usually some dilatation of the superficial vessels, but in no case is there dilatation of the pupil. There is no interference with accommodation; it does not affect the corneal epithelium.

Treatment of Joint Stiffness by Gradual Rectification Combined with Massage.—

NORSTRÖM, G. *Medical Record,* vol. lxviii, No. 19, p. 732, Nov. 4, 1905.

Stiffness of joints may be caused in three ways: traumatism, rheumatism and gout, or by chronic inflammation due to tuberculosis. Cases of traumatic ankylosis are readily amenable to treatment, though difficult cases occur in which the false ankylosis has followed periarticular fractures. Practically true ankylosis never follows immobilization. False ankylosis of rheumatic origin has many and varied difficulties. The older the process the more obstinate. When there are no synechiæ or products of connective tissue and the pathological changes are confined to the periarticular fibrous tissue, the tendons, and the fleshy parts of the muscles, rectification combined with massage gives results that could not be obtained either by forced extension or by forced flexion alone. In false ankylosis due to gout or following granular synovitis the condition is more favorable for treatment. In tuberculous lesions interference is not contraindicated if there is reason to suppose that the bacilli have disappeared. Massage employed before rectification softens the tissues and facilitates the latter. Massage performed after rectification will reduce the slight swelling often produced by the manipulations.

Treatment of Leukemia and Pseudoleukemia by the Roentgen Rays.—

HOLDING, A., and WARREN, M. *New York Medical Journal,* vol. lxxxii, No. 20, p. 1001, Nov. 11, 1905.

The literature up to date shows that twenty-five cases of splenomyelogenous leukemia have been reported as having been treated by the *x*-rays. Eight cases were symptomatically cured, fifteen cases improved, and two cases unimproved. Of eight cases of lymphatic leukemia, three were improved and five were unimproved or fatal. Twenty-two cases of pseudoleukemia were similarly treated, six cases being symptomatically cured, thirteen improved, and three cases unimproved or fatal. These results are striking in view of the fact that practically all such cases were regarded as irremediable prior to the use of the *x*-rays. In applying the *x*-rays to these cases a tube of sufficient power must be used to penetrate the

diseased organs. A low vacuum tube expending its energy upon, but not penetrating, the skin is to be avoided.

THERAPEUTIC BREVITIES.

Castor Oil Powder.—

The *Lancet* of November 4 refers to the somewhat remarkable fact that castor oil can be combined with another substance to form a light powder, containing as much as 50 per cent of pure oil. The powder is quite dry, in fact almost dusty. It is practically tasteless, or at least quite free from the flavor which makes castor oil nauseous. The powder mixes well with porridge, milk, or other liquids, and in this form children take it readily. It is necessary to mix the powder with a small quantity of the liquid to be used until it forms a paste, after which more liquid may be added.

Cocaine Injections in Facial Neuralgia.—

W. Spitzmüller recommends repeated injections of cocaine into or as near the nerve trunk as they can be made in cases of facial neuralgia. In one case during a period of three weeks nine injections were made, after which the patient remained free from pain, and six months later there was no recurrence. Several minims of fluid is injected directly into the bony canal from which the nerve emerges, as near as possible to the trunk of the nerve.

The Action of the Bromide of Ammonium.—

Frank Charteris (*Therapeutic Gazette,* Nov. 15, 1905) calls attention to the fact that the bromide of ammonium is more toxic than the bromide of sodium. With this salt the predominating action is due to the ammonium no matter how the drug be given, and if administered in sufficient quantities it causes convulsions and death from respiratory failure. With repeated non-toxic doses a bromide action may be produced.

MEDICINE.

The Parathyroid Glands in Graves's Disease.—

HUMPHRY, L. *Lancet,* clxix, No. 20 of vol. ii, p. 1390, Nov. 11, 1905.

Attention is called to the paucity of information in reference to the parathyroid bodies in man, though from the standpoint of the internal secretions they may be of the utmost importance. Much experimental work has been done upon the parathyroids, which has shown that removal of them together with the thyroid produces acute symptoms and usually a fatal result. Removal of the four parathyroids, the thyroid being left intact, produces the same acute symptoms but with a less frequently fatal result. Removal of the thyroid alone, leaving the parathyroids, is followed by chronic symptoms of myxedema and by trophic lesions. There are some differences in the results as regards the date of onset of symptoms and the relative mortality. The results appeared to be most marked in the carnivora; the acute symptoms produced by removal of the parathyroids alone or both sets of glands occur soon or after a few days, and consist of tremors, a slow and unstable gait with contractures of limbs, emaciation and muscular weakness, tachycardia, vomiting and diarrhea, scanty urine with albumin, attacks of dyspnea, followed sometimes by tetany, convulsions, and death. It is said that after removal of the parathyroids in the dog the thyroid gland undergoes a compensating hypertrophy with changes similar to those found in Graves's disease, namely, enlargement of the vesicles with alteration in shape.

The writer has studied the parathyroid bodies in four cases of Graves's disease in which post-mortem examination was held. In one case the thyroid gland was enlarged and the vesicles were full of a watery fluid under some pressure, which spurted out when the vesicles were opened by pricking. The glands

showed microscopically the changes usual in a recent case of exophthalmic goitre. In this case only two parathyroid glands could be found after the most careful search in all the usual situations. In this and a succeeding case the parathyroids showed the same changes. There was extensive infiltration of fat which intruded between the columns of gland cells, and in parts only a few scattered epithelial cells were left between the masses of fat. In another case of Graves's disease occurring in a man 49 years old the thyroid gland was enlarged and showed microscopically the characters of Graves's disease. The parathyroid glands were infiltrated with fat, but not to the same extent as in the first two cases. The fourth case occurred in a girl of 22, with early but well marked Graves's disease. The right lobe of the thyroid was removed by operation, and on examination one parathyroid was found close to the stump of the inferior thyroid artery. The gland was fixed in Miller's fluid and formalin four hours after removal. There was no fatty infiltration, but the cells of the gland appeared to be undergoing change. The protoplasm was diminished; the nuclei were large and crowded together. The microscopical appearances of the thyroid lobe were characteristic of Graves's disease.

These observations have been supplemented by the examination of the parathyroids in twenty-six cases of death from various causes. The glands are not easily found post mortem. Commonly they are four in number, two on each side, all external to the thyroid gland. They are oval or circular in shape, and are yellowish or fawn color, differing in this respect from the accessory thyroid and lymph glands which abound in the neighborhood. They are often embedded in fat or attached to a pedicle of fat, that may sometimes be identified by a fine network of veins showing on the surface of the capsule. In the majority of cases a microscopical examination is necessary to identify them. Their average size is 6 by 3 by 1.5 millimeters, though they sometimes reach a size of 15 by 6 by 3 millimeters. The weight varies from 0.010 to 0.100 gramme. To find the parathyroids a transverse incision should be made above the thyroid cartilage and be carried through the pharynx as far back as the prevertebral fascia. The whole mass of glands, trachea, and esophagus should be removed with the surrounding tissues down to the lowest rings of the trachea. In this way is it alone possible to be certain that the parathyroids are not left behind. The posterior surface of the thyroid gland should be carefully examined from behind the cellular tissue stretched out between the thyroid and the esophagus. If the specimen is fresh the posterior superior parathyroid will probably be seen underneath the cellular tissue, where the posterior border of the thyroid gland touches the esophagus, and at about the level of the cricoid cartilage. If not, a little dissection will soon reveal the inferior thyroid artery, in close proximity to which lies the parathyroid. The superior glands are most constant in position. The anterior inferior glands are also two in number, their usual position being at the lower edge of the lateral thyroid lobe or below the thyroid on the front or side of the trachea, embedded in fat.

The parathyroid is an epithelial gland enclosed in a fibrous capsule, and is usually quite separate from the thyroid gland, but it may be enclosed in the same capsule or in an accessory thyroid. It has no duct, but it is penetrated by a central vessel which runs longitudinally through it, giving off branches. There is often some indication of division into lobules by fibrous septa, and small eyelets of fat may be found in the course of the septa and vessels. In addition to the four cases of Graves's disease the writer has examined microscopically the parathyroids in eighteen cases in which death was from various causes, the ages of

the patients varying from 1 to 71 years. The parathyroid tissue in all the cases under 50 appeared normal, with the exception of one; this was taken from a girl aged 14 who died from burns. The parathyroid in that case showed some excess of fat, and there was an enlarged thymus weighing 18 grammes. Of six cases in which the ages were from 50 to 72 years there was more or less fatty infiltration, the most affected being a man who died from diabetic coma, aged 60 years.

As the writer points out, it would be improper to draw conclusions from so few cases, but the possibility is suggested that the parathyroids may undergo involution in advancing years, they not having the same importance in later as in earlier life. In none of the cases of Graves's disease did the parathyroid glands show any signs of compensatory hypertrophy.

Hodgkin's Disease, with a Milky, Non-fatty Pleural Effusion.—

EDSALL, DAVID L. *New York and Philadelphia Medical Journal,* vol. lxxxii, No. 17, p. 838, Oct. 21, 1905.

The patient was a boy aged 12, whose one sister had died of tuberculosis and whose father had scars on the neck supposed to result from operation done in childhood for removal of tuberculous lymphatic glands. About two years ago a small lump appeared in the left side of the neck and rapidly increased in size; a year later this was removed. He made a rapid recovery, but shortly afterward another lump appeared near the wound, followed by a succession of similar growths. General health did not suffer appreciably until about three months ago, when he had a sudden sharp pain in the abdomen which continued for some time afterward, finally becoming intermittent, and persisting in the latter form for some time. He had also pain in the chest and back, and occasional attacks of mild diarrhea. Shortly before he came under observation there was an increase in the size of the abdomen, followed in a few days by a swelling of the scrotum and prepuce. A little later he developed cough. When first admitted to the hospital he appeared fairly well nourished, but was pale, his face puffy and expressionless; the left side of his neck showed a scar, on each side of which were numerous large glands, the largest one and a half to two inches in diameter, at least eight or ten being fully an inch in diameter. Enlarged glands were also found in the axilla and groin. There was slight edema of the whole surface of the body, marked edema of the legs, scrotum, and prepuce. Examination of the lungs was negative. There were no heart murmurs. The distention of the abdomen prevented palpation of the liver and spleen. Examination of the urine showed a trace of albumin and a few hyaline casts. Blood examination showed erythrocytes, 4,272,000; leucocytes, 14,000; hemoglobin, 67 per cent. Four days after coming under observation a small amount of fluid was found in the left pleural cavity, and the fluid in the abdomen was found to be constantly increasing. Later 900 cubic centimeters of fluid was removed from the left pleura. The fluid was so milky that it was at first thought to be pus. It was not pus, and when examined microscopically showed numerous lymphoid cells, an occasional polymorphonuclear cell, and vast numbers of very fine highly refractive globules, that had somewhat the appearance of the globules of a fine fat emulsion. There were no red blood-corpuscles in it, and no bacteria were seen. Cultures from this fluid proved negative. Later the left pleural cavity again filled with fluid, causing great distress. It was again removed, the total amount this time equaling 1500 cubic centimeters. It had the same appearance as that previously observed. After standing for a day or two a jelly-like coagulum formed in it, but the remaining fluid was still milky. The patient grew rapidly worse, had trouble from cough, marked

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dyspnea, and increasing prostration; the pleural cavity rapidly filled again; the general edema increased remarkably, and he grew extremely weak. Death finally occurred from exhaustion. Full autopsy notes of the case are given; careful microscopic, cultural, and inoculation experiments were made with tissue of the lymphatic nodes, and the case determined to be one of Hodgkin's disease.

One of the chief features of interest was the milky appearance of the fluid from the pleural cavity. After a lengthy account of the chemical conditions of this and similar fluids Dr. Edsall concludes that a milky appearance of animal fluids may be due to three causes. The two that are most commonly mentioned are the presence of actual chyle, this constituting a chylous effusion, or the presence of degeneration fat without any actual escape of chyle into the effusion, this constituting a chyliform effusion. The third cause is the presence of altered protein, usually altered globulin, the milkiness in this instance being only partially if at all the result of the presence of fat. The only way of determining whether the milkiness is due to fat or protein is not merely to estimate the amount of fat present, but to determine removal of the fat with ether, and an alkali causes the milkiness to disappear. If it does, the milkiness is due to fat, but it has not yet been determined that the milkiness of the effusion is definitely due to admixture of chyle and not to degeneration fat. It becomes more probable that it is chylous if substances that are easily recognizable by their color are ingested, and are a short time afterward found in the fluid removed by puncture; and the probability that the fluid is chylous may also be increased by study of the chemical character of the fat, for chyle fat and degeneration fat apparently show chemical differences. The latter point, however, is not definitely established, and it is often very difficult, particularly without a post-mortem examination, to be entirely sure that a fatty effusion is chylous, and not chyliform. If shaking the fluid with ether and an alkali leaves it still milky, the appearance is due to altered protein. It is probable that in a fair proportion of cases of milky effusions proper study will show that the lactescence is due in part to altered proteid, even though a good deal of it may be determined to be due to fat.

Pathology, Diagnosis, and Treatment of Various Forms of Meningitis.—

Tooth, H. *British Medical Journal,* p. 1010, Oct. 21, 1905.

The writer's studies are based upon 65 cases admitted to St. Bartholomew's Hospital during the past eighteen months. Of the cases 31 were tuberculous, 7 pneumococcal, 3 streptococcal, and 17 meningococcal, while 7 were undetermined. The seven cases of recovery were included in the meningococcal infections. Four only of the cases were over 20 years of age. The larger number of cases occurred between the first and third year. In only one of the tuberculous cases were the meninges affected without evidence of generalized tuberculosis. Otitis media was a frequent source of infection, and a number occurred from the accessory nasal sinuses.

Optic neuritis was present in one-half of the cases of tuberculous meningitis. In two the disk became blurred on the third day, and early in the case there was headache and vomiting. In the meningococcus group the disk lesions were less common, and out of seventeen cases only two showed active optic neuritis. Amaurosis without obvious changes in the fundus, and generally temporary, is a comparatively common symptom in meningococcus meningitis, but it was noted in only one of these cases on the seventeenth day, and it lasted for about ten days. The patient ultimately recovered. The pupils are variable, even in the course of the same case. They are frequently dilated or unequal. Their condition possesses

no differential diagnostic value. A common symptom is retraction of the upper eyelid, giving a peculiar staring appearance resembling Graves's disease. Paralytic symptoms are uncommon, with the exception of the muscles which supply the eye. Squints are common, the most common being an internal strabismus. Conjugate deviation is not uncommon, and may be due to a lesion of the sixth nucleus, or perhaps to inflammation of the cortex. Squints are most common in meningococcus meningitis, and occurred in 14 out of 17 cases. In eight cases that recovered all except two had some form of squint in the course of the illness. In tuberculous cases the symptom is less frequent, being observed in 14 out of 31 cases. Of most diagnostic interest is the muscular rigidity, which may be general or confined to certain groups. Among the earliest evidences of hypertonia is a stiffness of the neck muscles and a slight resistance to passive flexion, often with some evidence of pain. Later this becomes more marked, and there is the familiar appearance of cervical opisthotonos. This increased muscular tonus may be confined to the spinal muscles, but it may involve the abdominal and thoracic groups. The extremities also share in the general rigidity, the position assumed being flexor, as the spasm is only of temporary duration, and not prolonged opisthotonos. The limbs are usually in extreme extensor spasm. Tonic spasm local or general occurred in 16 of the 55 cases. The course of the fever in meningitis may present no distinctive features. Whether the temperature rises or falls in the course of a fatal case the pulse-rate rises, and the respiration tends to go with it. This is true of all forms of meningitis. In tuberculous meningitis an irregular oscillatory temperature, generally above normal, and with frequent sudden falls to normal or below, is the most common type. A high, continued fever is less common than in the other infections.

The writer speaks rather pessimistically of treatment. Mercury and iodide of potassium has been recommended, and it succeeds very well in rickety and ill nourished children with mild, irregular fever. The symptoms in these cases are suggestive of meningitis, and have sometimes been called meningismus. When a meningocephalitis is fully established it is doubtful if any operation is of service. It is not a question of removing fluid from the ventricles and subarachnoid space, the substance of the brain itself is hyperemic and swollen. The removal of fluid by lumbar puncture may affect some of the milder cases in which there is a tendency of the infection toward involvement of the arachnoid and base of the brain. The removal of the fluid in these circumstances may aid an already strong tendency to recovery.

The Sleeping Girl of Gloucester.—

HUBBARD, F. H. *Annals of Gynecology and Pediatry,* vol. xviii, No. 11, p. 563, November, 1905.

The sleeping girl of Gloucester, who attracted much attention during the years 1902 and 1903, is the subject of the writer's communication. She was a tall, well-developed girl of 11 years, an exceptionally bright scholar, fond of music, spending much time in piano practice, and often taking part in church concerts and social functions. She was fond of dress and appeared in public, and was healthy with the exception of occasional attacks of indigestion. In the spring of 1902 she fell from a fence, injuring her back severely, so that she was kept out of school for a week. At the time of the fall she complained of abdominal pain and headache, with loss of power in the lower limbs. These symptoms gradually improved. Two weeks later there was a return of the trouble, due, as was supposed, to exposure in the hot sun. There was headache, pain in the abdomen, and some vomiting. The evening of this illness she was

given a drink of whisky at bedtime. From this time on, while she was up and dressed, she kept more and more to her room, was disinclined to talk, grew petulant and whimsical. She had a dreamy, far-away look, and apparently paid little attention to what was said to her. She steadily lost strength and insisted on going to bed. In the family there was a lack of discipline. Medical instructions were carried out or not as they met with approval, and outside suggestions were acted upon. At this time the child was in bed with her eyes tightly closed, did not take nourishment, and kept up an automatic crying much of the time. Two days later the physician was dismissed because he would not use narcotics freely. In the next three weeks, while there was no temperature and few objective symptoms, the nervous condition became worse. She was nourished by enemas, large doses of morphine were given, and she was kept under ether for twelve hours for convulsions, which recurred as soon as the anesthetic wore off. She was at last given up to die. The periods of sleep or rest grew longer, and would last two or three days.

At last the writer, who had first seen the case, consented to take charge of the girl and removed her to a hospital. Prior to her removal her mother said she had been in a trance for three weeks, neither opening her eyes nor speaking. The temperature was normal, respirations 22, there was no rigidity of muscles, she was extremely emaciated, and gave no signs of life except a noiseless respiration. If the arm or head was moved that position was retained until it was changed. Tickling the feet, pricking with a needle or a strong electric current made no impression. She was fed by the mouth every two hours. For the first five or six days it was necessary to hold her nose; after that on placing the drinking-cup to her mouth she would swallow. On the eighth day it was noticed that if her head or hand were placed in a constrained position it would slowly move. On the ninth day the eyes slightly opened. On the eleventh day she opened her eyes, spoke, and remained awake, excepting during normal sleep. She had no recollection of what had transpired during the trance period or how she came to the hospital. There was but little use of the hands at first, but they gradually recovered, as did power in the lower limbs, but she could not stand alone for a month after regaining consciousness. On returning to her home she did not recognize her former playmates, and had forgotten her music and even the alphabet. Any reference to her previous condition was distasteful. The recollection of things and affairs gradually returned, music first, but she did not attend school the first year after her recovery. At present she is apparently in good health, attends school regularly, and progresses well in her studies.

An Analysis of the Reported Cases of Osteoarthritis of the Spine.—

GUFFEY, D. C. *University of Pennsylvania Medical Bulletin,* vol. xviii, No. 9, p. 250, November, 1905.

This disease may be defined as an alteration in the normal curves and restriction of ordinary movements of the spinal column. It is a subacute or chronic progressive ankylosis of the vertebral column characterized by structural changes in the bones, ligaments, and articular cartilages of the joints. That the disease is neither rare nor modern is shown by the fact that exquisite examples of it are frequently found on the dissecting-room table, and that a well marked example of it has been found in a mummy dating from 3700 B. C. The disease has been noted in the gorilla, the horse, the cat, and the ox. Notwithstanding its frequency the writer has only been able to collect 131 cases in the literature, which are abstracted. The causes of the disorder are obscure, and 75 per cent of the cases occur in

man. One of the most constant antecedent factors is exposure to cold and wet, and it is possible that traumatism may also be frequent.

The onset is as a rule gradual and insidious, beginning usually with pain and stiffness, which may be regarded as the earliest symptoms. The pain may be felt in the small of the back, interfering with stooping, or in the neck, interfering with nodding and rotation. It may be severe or mild, sharp or dull, felt at the site of the lesion or referred, and may be constant or paroxysmal, unilateral or bilateral. It is worse after rest and gets better by movement. The pain is felt in the nerve endings and not in the course of the nerve trunks. Pain is usually elicited by pressure. As a rule the pain becomes less severe as the disease advances, probably due to contraction of the tissues relieving the pressure on the nerve roots. There may be hyperesthesia, paresthesia, and anesthesia, or a neuralgic type of pain. Limitation of motion is usually greater on one side than on the other, and it gradually increases, appearing most often in the lumbar region and ascending. In time the whole vertebral column may become stiff, so that even nodding and rotation of the head is impossible. The most common deformity is a dorsal kyphosis. This is brought about by absorption of the intervertebral disks shortening the spinal column, which causes a stooping posture. The gait even when the hips are not involved is shambling, irregular, and difficult. The patient stands with the knees bent and the toes turned out. In complete ankylosis when the patient is lying down the hips and the shoulders cannot touch the bed at the same time. In exceptional cases the patient sits over-straight. This is due to a rapid fixation of the spine before there has been atrophy of the intervertebral disks. Eight of the writer's collected cases belong to this variety. The chest and pelvis are often flat. Exostoses are frequently found and ankylosis of other joints may be present, the most frequent being the hips and shoulders, but any joint in the body may be involved. Atrophy of the muscles occurs, especially of those concerned in the movements of the affected joints, those of the back, shoulder, and hip being the most frequently involved.

The diagnosis is not difficult. The only disease that it is likely to be confounded with is the ordinary tuberculous spondylitis. The deformity of Pott's disease is angular and usually in the dorsal region, while in this variety of spinal trouble the deformity is not angular. Hysteria may simulate the disease, but the use of an anesthetic will show the functional nature of the immobility. Pachymeningitis is as a rule confined to the cervical region, and is more acute in its onset. In osteitis deformans there is associated enlargement of the calvarium, a broadening of the pelvis, and deformity in the long bones.

Treatment to be of avail must be begun early, before deformity has taken place. When there is much distortion of the spine some relief may be obtained, but cure is impossible. In all about twelve patients have been reported as relieved, if not cured. Treatment should be both constitutional and local. The diet should be nutritious, there should be plenty of fresh air and sunshine, warm baths, and tonics such as iron, cod-liver oil, arsenic, and strychnine. The salicylates, except occasionally in relieving pain, fail. The skin should be kept healthy by warm baths and massage, and the kidneys should be carefully watched. Such patients do best in a dry, warm climate. Locally the spine should have a mechanical support; a plaster-of-Paris jacket should be applied in an erect position. This relieves irritation and muscular spasm. After the acute symptoms have subsided a flexible support may be employed, such as a spring-steel brace or a leather jacket. Forced movements or strains are to be avoided. Motion both active and

passive should be kept up as long as possible if no injury is done, as it tends to prevent ankylosis.

The Early Diagnosis of Pulmonary Tuberculosis.—

PRYOR, J. H. *Medical Record,* vol. lxviii, No. 22, p. 847, Nov. 25, 1905.

Pryor states that as the result of observation and experience gained while acting as the first medical superintendent of the New York State Hospital for the Treatment of Incipient Tuberculosis, his conviction that pulmonary tuberculosis is rarely recognized at an early and proper time for successful treatment has been decidedly strengthened. This conclusion is corroborated by the fact that the hospital, which was created under a law providing that only incipient cases could be admitted, has never contained more than one-third of the number of cases that could be accommodated. The following definition of incipiency or favorability was agreed upon by a committee of the National Association for the Study and Prevention of Tuberculosis: "Slight initial lesion in the form of infiltration limited to the apex or small part of one lobe. No tuberculous complications. Slight or no constitutional symptoms (particularly including gastric or intestinal disturbances or rapid loss of weight). Slight or no elevation of temperature or acceleration of pulse at any time during twenty-four hours, especially after rest. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent."

Inquiries submitted to a number of sanatoria in the United States to learn the percentage of incipient cases received, as thus defined, reveal the fact that the average percentage of all patients under treatment which could be designated as early and favorable varies from two to thirty. An analysis of all cases treated at the New York State Hospital shows that 60 per cent were received. In attempting to account for this state of affairs the author says that one reason is that the patient does not seek medical advice early enough. This is especially the case among the poor, who also often receive incompetent counsel when they go to a physician or dispensary. Another reason is the faulty education in medical schools and the recent tendency to give prominence to laboratory methods at the expense of the skill of the clinician. The classical symptoms almost invariably presented in combination are loss of appetite, chlorosis or anemia, loss of weight, cough, with or without expectoration, hemorrhage, and fever. It is extremely rare that all of these are associated at an early time. They are apt to be present at a later stage. This is particularly true of patients who have had rest, nourishing diet, and open-air treatment. Many times, under these conditions, few or no symptoms are apparent, and yet the disease may be progressive. The author discusses at length the physical examination of the chest, and points out the necessity for painstaking examination of the patient with the clothing removed to the waist.

The Larynx in Typhoid Fever.—

JACKSON, CHEVALIER. *American Journal of the Medical Sciences,* vol. cxxx, No. 5, p. 845, November, 1905.

From laryngoscopic observations of 360 typhoid fever cases the writer concludes that serious and fatal lesions of the larynx are more frequent than is realized. Death may occur from laryngeal stenosis without even the existence of a laryngeal lesion being suspected in the absence of laryngoscopy. If pain and hoarseness be depended upon a diagnosis will seldom be made. Pain is often masked by toxemia. Cyanosis and dyspnea are rare, apnea is common. Unlike the complications of the exanthemata, ulcerative laryngitis complicating typhoid fever bears, as to the likelihood of its occurrence, its course, and its termination, a close relation to the severity of the primary disease. The severity of the laryngeal lesion is in

direct proportion to the toxemia, pyrexia not being in itself a factor, but only an index of the toxemia. Thrombosis of laryngeal vessels in the mucosa or deeper is probably the most frequent local initial lesion. Mixed pyogenic infections are the rule. Laryngeal lesions due to the bacillus typhi abdominalis are exceedingly rare. The prognosis as to life is good if considered apart from the general malady. Not only the life but the laryngeal, vocal, and respiratory functions will be saved if a tracheotomy be done early. Death from laryngeal lesion means a death for want of an early tracheotomy. Prophylaxis consists in good ventilation, without draughts, sterile bedding, oral antisepsis, sterile food and water. Potassium iodide, hydrargyrum biniodide, benzoin inhalations, and oral antisepsis are the best remedies. Early tracheotomy under local (Schleich solution) anesthesia will cure almost every case.

Polyuria as a Prognostic Sign in Typhoid Fever.—

SIMON, R. M. *British Medical Journal,* p. 1329, Nov. 18, 1905.

During a period of fifteen years past the writer has been studying the total amount of urine passed in the later stages of typhoid fever, regarding a polyuria as an exceedingly favorable sign. Polyuria is commonly observed at the end of nearly all febrile disorders, but no special attention has been paid to it in connection with typhoid fever. Toward the beginning of the fourth week, seldom earlier, sometimes a little later, the urine increases in quantity from 30 ounces to 60, 80, or even 100 ounces daily. During a period of nine years he had daily observations made of the amount of urine passed by every patient suffering from typhoid fever. It was found that polyuria occurred not only in every case that was doing well, but also in many severe cases in which no general improvement could be observed. It was found that even in severe cases if polyuria occurred the patients all recovered. The absence of polyuria in a case supposed to be doing well was exemplified in a recent case. Despite a real general improvement, which was not associated with an increase in the amount of urinary excretion, it was soon followed by a short relapse, at the end of which there was the critical polyuria followed by an uninterrupted convalescence. In no case in which the writer has observed polyuria has he known a perforation to occur or hemorrhage. A relapse is also a great rarity after the polyuria is established. The belief is expressed that if these observations are substantiated we have in this symptom a valuable prognostic indication in typhoid fever.

Non-gonorrheal Urethritis.—

SPOONER, H. G. *Medical Record,* vol. lxviii, No. 20, p. 772, Nov. 11, 1905.

The writer first sketches the history of the study of urethritis, which was formerly confused with syphilis, and later was thought to be invariably due to the presence of the gonococcus. Now it is recognized that other microörganisms may give rise to urethritis, as has been shown by the experiments of Bockhart, Legrain, and others, who inoculated the urethra with various pyogenic organisms and obtained positive results. Such cases are not as rare as is usually supposed, and they require consideration at the hands of clinicians. As the causes that contribute to the production of urethritis are so numerous the author prefers a classification based upon the clinical conditions in which cases of non-gonorrheal urethritis have been observed, and he suggests the following classification: (1) Urethritis caused by external irritation: Coitus, catheterism, ungratified erections (?), masturbation (?), medicated injections. (2) Urethritis caused by internal irritation, mechanical, chemical, and of constitutional origin: Food, drinks, drugs, and gout. After the urethra has been chron-

ically inflamed by a previous gonorrhea, or by any other cause, indulgence in coitus renders the urethra more susceptible to germ invasion. From the clinical point of view differential diagnosis is impossible, but as a rule in non-gonorrheal urethritis the incubation period and the course are shorter and less painful than in the specific form. Non-gonorrheal urethritis of constitutional origin must be treated so as to remove the exciting cause. When due to pyogenic bacteria the treatment is the same as in gonorrheal urethritis. Some cases of aseptic urethritis of unknown origin are not influenced by any form of treatment.

In conclusion the author says: (1) The presence of pyogenic bacteria is not sufficient to cause urethritis until the vitality of the epithelium is lowered. (2) There are two varieties of non-gonorrheal urethritis of primary origin, those caused by external irritation, and those due to internal irritation, chemic or toxic. (3) No incontestable cases of urethritis caused by gout, rheumatism, the arthritic diathesis, diabetes, or mumps are contained in the literature.

Addison's Disease in Youth.—

WEIGALL, R. E. *Australasian Medical Gazette,* vol. xxiv, No. 10, p. 545, Oct. 20, 1905.

The discouraging results following substitution feeding in Addison's disease lends interest to a case in which it seemed to be successful. The case reported occurred in a boy 18 years of age, who was brought to the hospital in a fainting condition. He was gasping for breath and sank exhausted into a chair. A walk of half a mile preceding his admission was accomplished with the greatest difficulty, and only after repeated rests. The pulse was uncountable; respiration was rapid. The symptoms had existed for three months. It was stated by the mother of the patient that the boy's father had died of the same disease after some years of illness. The skin was generally pigmented, with well marked patches on the forehead. The patient only complained of extreme fatigue. After a few days extract of suprarenal was administered in the form of tablets, beginning with one three times a day, which soon increased to two three times a day. Under the treatment improvement was rapid. In two weeks there was a gain of six pounds in weight and the pulse had decreased to 110, and he was able to move about the room with less difficulty. The pigmentation was less marked. The treatment was continued until 500 tablets were taken. The patient gained 56 pounds in weight, the pigmentation entirely disappeared, and he was able to resume work as an active farm laborer.

The Subcatabolic Origin of Common Colds.—

WAKEFIELD. *Medical Record,* vol. lxviii, No. 23, p. 894, Dec. 2, 1905.

A cold represents the results of disorders of metabolism due to local circulatory disturbances following the unequal exposure of some part of the body to cold. The degree of temperature is subordinate to the state of inequality produced, for a cold may be due to the extrinsic effect of either cold or heat, if sufficiently pronounced or abrupt to insure a localized action of definite heterogeneity from the balance of the organism. The author has discovered that protoplasm as such is subject to the general laws that heat causes expansion and cold contraction, or, in other words, cold heightens and heat lowers the specific gravity of protoplasm in general, not excepting that of the parenchyma. It is the writer's observation that the molecular weight or density of the parenchyma and all the living protoplasm is increased by cold and decreased by heat. Cold is productive of high density, compactness, and tonicity, while heat induces low density, looseness of texture, flaccidity, expansion, dilatation, elongation, and atony. This is not a nervous effect, but a direct responsive reac-

tion of protoplasm, *per se,* as is attested by the fact that it is as marked in nerveless unicellular and multicellular organisms as in those of the highest types of nervous organizations. In analyzing the mode of origin of a common cold the author says that we see that primarily a condition of disequilibrium is produced. A subject, during a period of normal heat balance, gets wet, cold feet; a state of contraction of the tissues of the lower extremities is attained, the blood is ejected from the peripheral vascular areas to the more roomy reservoirs of the splanchnic veins, which readily dilate to receive it, with the result that a pernicious splanchnic venous stasis is produced, concurrent with a capillary and arterial blood deficiency in the extremities and with an inevitable suboxidation of the dependent tissues in the extremities. The author then describes the various stages through which such an affection passes, and points out the connection between the events involved in such a course of reasoning and the phenomena attending various other conditions depending on suboxidation. The usual treatment has been more or less successful in the past, but only with a vague idea of the pathology and etiology of the condition.

Physiology of Human Nutrition.—

BILLINGS, F. *Journal of the American Medical Association,* vol. xlv, No. 19, p. 1381, Nov. 4, 1905.

The writer endeavors to clear up some of the popular fallacies regarding the evils of a proteid diet. He discusses the known facts regarding the physiology of human nutrition and emphasizes its importance. He reviews the work of prominent investigators in this line and relates in some detail the experiments of Chittenden, which seem to show that the so-called standard diets are unnecessarily rich in proteids and that the quantity of the latter contained in them may be largely reduced without damage to the bodily welfare. Billings seems to agree with Chittenden that the fats and carbohydrates could be diminished with safety, and that it is in the amount of these latter that the dietetic variations consequent on occupational and climatic conditions will usually have to be made. He also agrees with Fletcher that the average individual does not masticate his food sufficiently, and states that any physician who has washed out many stomachs will confirm this observation.

Billings says that according to the exogenous theory of Folin it seems unlikely that a proteid excess is detrimental. He states that this metabolism theory of Folin explains the persistent tendency of the normal body to maintain nitrogenous equilibrium when a large amount of proteid is consumed, even when this involves the formation of an excessive amount of urea. He states that the clinical facts of gouty intoxication suggest, however, the possible accumulation of a protein reserve greater than can be retained by the organism with perfect safety, and that the advisability of temperance in diet, but not necessarily vegetarianism, as Chittenden points out, is sufficiently obvious.

The Elimination of Endogenous Uric Acid in a Case of Chronic Gout.—

LAIRD, A. T. *Albany Medical Annals,* vol. xxvi, No. 11, p. 742, November, 1905.

The writer discusses the various theories of the formation of uric acid, and records a carefully studied case of chronic gout in which it was found that the uric acid elimination on a purin-free diet was below the normal limits. In the intervals between the exacerbations there was marked variation in the amount of uric acid eliminated. Low values were reached preceding acute symptoms, and at times during the intervals the excretion was very low. At other times the highest values reached during an attack were approached. The phosphoric acid elimination was below normal. In the first series of tests the phosphoric acid curve followed the uric acid curve quite

closely; in the second series not at all. The leucocyte counts were normal and did not vary with the uric acid excretion. No digestive leucocytosis was noted. The acidity was at all times below normal. The highest values were obtained during the acute exacerbations.

In summing up the writer says that the principal source of the uric acid eliminated by man under normal conditions are the nucleins. There is an increased elimination of uric acid following the ingestion of substances which contain nucleins. This source of uric acid can be controlled. The endogenous uric acid is probably derived from more than one source. A large portion comes from the decomposition of the nuclein of body cells, but in part is probably formed by direct synthesis. With some purin-free diets the endogenous uric acid has in certain individuals shown a somewhat constant value in health. With other forms the amount of endogenous uric acid was not constant. In disease the elimination of uric acid shows marked fluctuations. How large a portion of the endogenous uric acid elimination under pathologic conditions is formed by synthesis is not known. The nucleins are one source of phosphoric acid excretion in the urine, but not the only source, and there is no constant relationship between uric acid and phosphoric acid excretion. Though the leucocytes are the source of endogenous uric acid, they are by no means the only source, and their number has no constant relationship to the excretion of uric acid. The part which uric acid plays in gout is still unsettled.

The Stomach in Pulmonary Tuberculosis.—

PALIER, E. *Medical Record,* vol. lxviii, No. 20, p. 775, Nov. 11, 1905.

The writer has studied the gastric conditions present in a number of cases of pulmonary tuberculosis, most of the patients being men between the ages of 22 and 45. He describes several of these, and says that his observations lead him to believe that in about 60 per cent of the cases of incipient consumption there is hyperchlorhydria, in 20 per cent the stomach is about normal, and in about 20 per cent there is hypochlorhydria. The diet must therefore vary in different cases of the disease, and it is necessary to study the condition of the patient's stomach before it is possible to lay down rules for his nutrition. The stomach tube is not likely to do harm if carefully used. The effect of gastric juice on the tubercle bacilli in the sputum swallowed was also investigated. It appears that the normal gastric juice is bacteriolytic to the tubercle bacilli, but *in vitro* the process is very slow. The author believes that in the stomach it is much more active, so that ordinarily no bacilli can pass the normal stomach and reach the intestine in virulent condition. In hypochlorhydria they undoubtedly can, and also under any conditions on repeated ingestion some may find opportunities to slip through and cause disease. The frequency of hyperchlorhydria with hypersecretion in pulmonary tuberculosis, the author believes, explains the frequency of gastric ulcer in this disease.

Essential and Paroxysmal Tachycardia.—

MORRISSEY, J. J. *Medical Record,* vol. lxviii, No. 23, p. 891, Dec. 2, 1905.

Tachycardia may be classed under two heads, essential and paroxysmal, and this classification may be subdivided into true and false. The true tachycardia finds its best illustration in permanent disease of the cardiac musculature; the false may be produced by causes far removed from the heart. There are certain definite peculiarities which distinguish true tachycardia from the evanescent "heart hurry" so frequently produced by the most trivial causes. (1) The attack is sudden in its onset, reaching its height almost immediately; (2) the patient may or may not be

entirely unconscious of the great degree of palpitation; (3) there is generally a definite period covered by the attack; (4) the reversion to the normal condition is as sudden as the onset, the vestiges of the storm through which the patient has passed rapidly disappearing. He then discusses the various forms of these types, and describes several cases which illustrate the differences in origin which may be exhibited. For example, one case was produced possibly by myocardial degeneration, and another by profound shock to the nervous system. In one case in which digitalis appeared to be of no avail, the fluid extract of convallaria majalis in five-drop doses, four times a day, seemed effective. He concludes by saying that the treatment of tachycardia is that of the condition from which it arises, or with which it is associated; but it must be remembered (1) that essential tachycardia is not accompanied with indigestion; (2) that paroxysmal tachycardia and the forms of tachycardia, accompanied by signs, no matter how slight, of Basedow's disease, are very frequently associated with dyspepsia; (3) that extreme cardiac arrhythmia frequently occurs without any indication of stomach disease; and (4) that tachycardia in its various grades is often but a symptom, a prominent expression of a neuropathic state, which requires to be approached for treatment from many sides.

The Comparative Study of Various Forms of Tuberculosis.—

RAVENEL, M. P. *American Medicine,* vol. x, No. 24, Dec. 9, 1905.

The writer states that (1) the division of mammalian tubercle bacilli into two types, human and bovine, first proposed by Theobald Smith in 1898, has been amply confirmed. These types have cultural, morphologic, and tinctorial characteristics, by which they may usually be recognized. The chief point of difference, however, is found in the very much greater pathogenic power of the bovine type. Bovine bacilli are, however, met which have low pathogenic power. (2) No other species of mammal has been shown to harbor a variety of tubercle bacillus so constant in its characteristics as to justify its classification as a third type. (3) Other species suffering from tuberculosis derive their infection from man or from cattle. (4) The human tubercle bacillus, as a rule, has a low pathogenic power for cattle, but cultures are not infrequently found which are virulent for the bovine race. (5) The bovine tubercle bacillus has the power of invading the human body and producing the lesions of tuberculosis. (6) We are at present unable to state the exact proportion of cases in which bovine tuberculosis is transmitted to man, but in view of the evidence at hand we must regard the disease in cattle as the source of a certain part of human tuberculosis, and any relaxation in our laws and precautions against bovine tuberculosis would be most unwise.

Is Paralysis Agitans Caused by Defective Secretion or Atrophy of the Parathyroid Glands?—

BERKELEY, W. N. *Medical News,* vol. lxxxvii, No. 23, p. 1060, Dec. 2, 1905.

Reference is made to the theories held by neurological writers that paralysis agitans is a microbic or humoral toxemia. A considerable number of observers believe that it is an endogenous toxemia. Lundborg suggested that it was due to an insufficiency of the parathyroid secretion. The removal of the parathyroids in animals causes within forty-eight hours salivation, tachycardia, tremors, rigidity of the muscles, convulsions, albuminuria, hurried breathing, loss of appetite, and emaciation, the animal dying in from two to ten days. The administration of the dried gland relieves these symptoms for a time, and in this way the life

of the animal is prolonged, but death ultimately takes place.

Working on this theory the writer has been able to administer physiologically tested glands to eleven cases of shaking palsy in all grades of advancement. A number of the cases were greatly improved, and all the patients remarked that there was an increase in courage, comfort, and mental energy while taking the remedy. The most of the parathyroid preparations on the market are inert. The active preparations vary so much in potency that they should not be used unless tested physiologically. The preparation deteriorates rapidly and should be kept on ice until used. The initial dose of the powdered glands is 1/20 grain two to four times a day, preferably in capsule. Larger doses produce weakness, constipation, and nervousness. The first good effects in the cases treated were noted only after fifty to seventy-five capsules had been taken. Of the eleven patients nine were helped, the greatest improvement being noted in the more recent cases, one of the patients considering himself relieved while under the influence of the drug. One patient reported that the tremors most recently appearing in the course of his case were improved, while those of longer standing were less affected.

Examination of the Leucocytes in Diagnosis and Prognosis.—

BROWN, T. R. *American Medicine,* vol. x, No. 19, p. 769, Nov. 4, 1905.

The writer in a very instructive paper refers in favorable terms to Hewes's method of counting the leucocytes. By this method, using the same eye-piece and objective, it was found that quite as accurate results were obtained as with the Thoma-Zeiss instrument. The origin of the leucocytes is still doubtful, and accurate knowledge of them will not be obtained until their mode of origin is known. Nevertheless, a study of these cells in various diseases and pathological conditions has demonstrated that they are of real practical help in diagnosis and prognosis of disease. There are only a few diseases in which a diagnosis can be made from the blood examination alone; in the majority of cases the condition of the leucocytes is only a factor in the diagnosis. It tells much regarding the progress in all forms of infection and inflammation. It aids in discriminating diseases presenting clinical pictures which are much alike, such as central pneumonia and typhoid fever, appendicitis, etc.

Pigmentation of the Pia Mater.—

SYMMERS, W. St. C. *Journal of Anatomy and Physiology,* third series, vol. i, p. 25, 1905.

The writer has observed that extensive pigmentation of the pia mater is far more common in Egyptians than in northern races. It is not marked in some southern races, such as the Greeks and Sudanese. Among the Egyptians it is by no means universal. In 148 autopsies it was marked in 77, slight in 64, and absent in 7. The pigmentation was most apparent on the lumbar and cervical enlargements, on the bulb, about the peduncles, and over the base of the brain, particularly on the optic chiasm and the orbital convolutions. There is no specific connection between the pigmentation and age, sex, and cause of death. The pial pigmentation seems to be a normal occurrence which is particularly marked in Egyptians.

Some Conditions Having as Symptoms Pain and Tenderness in the Right Iliac Region.—

MCGARRAHAN, J. T. *Albany Medical Annals,* vol. xxvi, No. 11, p. 719, November, 1905.

Pain in the right iliac region suggests disease of the vermiform appendix, and the majority of cases have an inflammation of the

appendix. This leads the average observer to conclude that all such cases have the appendix involved, especially if the symptoms are acute and there is associated elevation of temperature, rapid pulse, and seeming peritoneal involvement. Even when the classical symptoms are prominent a diagnosis should be made by careful exclusion, even if it involves more time, excepting where a lengthy investigation might jeopardize the patient's chances. In conditions of pain associated with some general systemic disturbance the tendency to blame it all on the appendix is far too common. Where a general peritonitis exists as a prompt sequel of some distinctly localized pain, prompt surgical intervention is the only treatment. Three case histories are given, in which other conditions than involvement of the appendix give symptoms closely resembling appendicitis.

SURGERY.

Bier's Osteoplastic Amputation.—

PRINGLE, J. H. *Lancet,* vol. clxix, No. 21 of vol. ii, p. 1465, Nov. 18, 1905.

Little progress has been made in improved methods of amputation. Syme's or Carden's amputation gives a stump that is capable of bearing the weight of the patient, but it is applicable to only a small proportion of cases in which amputation is necessary in the lower extremities. The majority of amputations have to be performed through the shaft of the leg bones or of the femur, and not one of these stumps is capable of bearing the patient's weight on its face. The artificial limb is made to take its bearings on some natural bony prominence higher up, and the result is that there is atrophy of the tissues of the stump. The evolution of Bier's osteoplastic amputation has been gradual. At first he employed a wedge of bone taken from above the point of section. This was turned and fixed at right angles so as to form something like a miniature foot. Later this was modified so as to cover the transverse saw-cut surface of the bone with a thin bone flap cut from the distal portion of the limb. In amputating through the middle of the limb a flap of skin and subcutaneous tissue is taken, preferably from the anterointernal aspect of the limb and reflected with care, so that there is no damage to the periosteum covering the surface of the tibia. Then three sides of the rectangular flap of periosteum are cut on the shin surface of the tibia, the two lateral incisions being made just beyond the margins of the surface of the bone, and the transverse incisions about one and one-half inches downward from the base of the skin flap. With an elevator the periosteum is raised for about one-third of an inch upward from the transverse incision, and then a fine saw is used to separate a thin flap of bone still adherent to the periosteum. If it consists of the whole thickness of the compact layer of bone it makes no difference. Its length must be equal to the transverse diameter of the tibia, but it may be made long enough to cover the transverse surfaces of the tibia and fibula. The writer has found it better to divide the fibula higher than the tibia, and to make the bone flap for the tibia alone. The bone flap is cut with a saw and the base snapped through, but the periosteal bridge connecting it to the bone of the stump should be carefully preserved. The bone flap being held up out of the way, a short periosteal flap is cut. The bones of the leg are then sawn through transversely. The prominence of the shin of the tibia should be removed, as well as any irregularities that may be present at the margins of the bone flap. After the vessels are tied the bone flap is sutured by the margin of its periosteal covering to the edge of the periosteum of the bone of the stump, and to the muscles of the

stump also, so that it lies close over the sawn end of the tibia. As soon as the wound is healed the patient is encouraged to walk on the surface of the stump. At the end of four weeks a wooden pin leg is fastened to the stump by plaster-of-Paris bandages and the patient is gotten out.

The writer has performed this operation twenty-four times, fifteen times through the leg, six through the femur, twice through the humerus, and once through the forearm. All of the amputations excepting two through the lower extremity have been able to bear the weight of the body on the stump. In the two cases in which failure resulted there was a necrosis of the bone flap due to its separation from the periosteum. The amputation by Bier's method requires a slightly longer time for its completion, but the results are far superior to the usual methods.

Transverse Incision in Abdominal Operations.—

ROCKEY, A. E. *Medical Record,* vol. lxviii, No. 20, p. 779, Nov. 11, 1905.

The transverse skin incision represents a further advance, for the cleavage lines of the skin of the lower abdomen are parallel to the wrinkles, being transverse with a slight downward curve. The transverse incision has already come into extensive use for cases in which the abdomen is to be opened in the median line, but the author applies the same principle to operations on the appendix and cecum, to exploratory laparotomy on the right side, and to colostomy and resection of the colon on the left side. The operation for ordinary acute, unruptured appendicitis, or the interval operation, is done through a transverse incision, slightly less than one and one-half inches in length, crossing McBurney's point at its center. This incision should lay bare the aponeurosis of the external oblique. Narrow retractors should be used and the incision completed on McBurney's lines. The advantage of this incision is that it falls along structural lines in the skin. The fibers of the aponeurosis of the oblique may be readily separated to twice the length of the incision, thus giving easy access to the transversalis, which, being the heavier and deeper, is then in line with the external opening, thus giving a maximum exposure, with a minimum incision. In this operation the peritoneum is incised transversely. In fat subjects a two-inch incision is necessary. When it is desirable to obtain more room, it may be done first by extending all incisions along the lines described. If a very large exposure is necessary, the superficial incision is extended to the median line and the incision in the oblique carried across the rectus. The sheath of the rectus is then incised along the outer side of the muscle, both above and below the transverse incision. This incision will give ample access to the parts in the most complicated cases of appendicitis, and through it resection of the cecum and anastomosis for malignant disease may be done. In the few cases where abdominal drainage is necessary it may be effected either at the point where all the incisions cross, or through a small slit in the aponeurosis of the external oblique, where the outer end of the cutaneous and deep muscular incisions overlie each other. Several cases are described in which difficult operations were done through this incision.

The Partial Occlusion of Blood-vessels, Especially of the Abdominal Aorta.—

HALSTED. *Bulletin of the Johns Hopkins Hospital,* vol. xvi, No. 175, p. 346, October, 1905.

The object of the experiments recorded in this paper was to determine the possibility of successfully occluding the abdominal aorta and other large blood-vessels of man by surrounding the vessels with metal bands which might be from time to time tightened so as to produce an increasing pressure. Bands of silver and aluminum were employed for the purpose,

and most of the experiments were performed upon dogs. Thrombosis was not observed in a single case; but when the metal bands were applied tightly enough to completely interrupt the circulation they caused atrophy and sometimes complete absorption of the vessel wall; in such cases hemorrhage was invariably prevented by the formation of connective tissue. With two or three exceptions there was no evidence of adhesion of the folded intima under the band; aortic walls folded on themselves so snugly that the band being still in place water could not be forced through the vessel with a syringe, could easily be smoothed out, and the full lumen reëstablished on removal of the band. Looser bands could remain applied to the aorta, femorals, and carotids for months at a time without occasioning macroscopic injuries to the vessel walls.

Dr. Halsted and Dr. Sowers were encouraged to believe that there might be a place in surgery for the application of this method and have twice used it upon human subjects, once to the left common carotid artery, and once to the arch of the aorta. The latter case was a patient dying of suffocation from aneurism of the arch of the aorta, and the attempt was made to encircle the aortic arch with a band of metal between the origin of the innominate and left carotid arteries; but the aneurism involved the entire arch of the aorta, and so defeated the object. The patient unfortunately succumbed on the operating table.

Valvular Closing of the Gall-bladder After Operation.—

ROCKEY, H. E. *Medical Record,* vol. lxviii, No. 23, p. 901, Dec. 2, 1905.

The writer has devised a plan of introducing the drainage-tube into the gall-bladder after cholecystotomy, which is intended to prevent the prolonged leakage of bile. The tube is inserted through the incision into the gall-bladder, which is surrounded by a purse-string suture of catgut. The edge is turned in so as to bring the peritoneal surface into contact with the tube, and then a second purse-string is placed about the first. On tightening this the first suture is invaginated into the gall-bladder, and a valve is formed varying in size according to the distance between the two sutures. The drainage-tube should be fastened to the skin by anchor stitches of silkworm-gut, to prevent the tension on the purse-strings and consequently puckering of the valve. This is best done by passing a silkworm-gut stitch at either side of the tube and tying a small loop above the first knot. A similar tie and loop with silkworm-gut is made around the tube about one inch from the skin. A safety-pin is then passed through the three loops, thus holding the tubes firmly in place. A firm dressing is applied, and a bottle suspended from the bandage over the tube.

Direct Fixation of Fractures.—

ROBERTS, J. B. *Pennsylvania Medical Journal,* vol. ix, No. 2, p. 102, November, 1905.

In most cases of fracture indirect fixation with splints and other appliances is sufficient to insure immobility. In some cases, owing to unusual muscular spasm or great obliquity in the line of fracture, such methods are inefficient. The small proportion of fractures requiring direct retention can sometimes be met by a transcutaneous fixation by wire nails. This method should only be employed where the character of the fractures is well understood and the parts can be readily reached.

The nails employed should be the ordinary form used by carpenters, and can be sterilized by boiling. To obviate some of the defects of ordinary nails the writer has had some made which are pointed like the surgical drill. This is thrust through the skin and muscles until it strikes the bone. It enters the compact layer of bone until the point becomes engaged, and it is then driven into the two frag-

B. J. C. D.

ments with the hammer. It remains as many weeks as desired. It is fitted with a head by which it can be readily withdrawn. Open fractures are those that have been explored by incision, and may be fastened with nails, but in such cases more satisfactory fixation is obtained by staples or plates. Staples are adjusted by first drilling holes for the points, and then driving the staples down into and upon the bones with a hammer. The staples which the writer employs are broad in the body so as to steady the bony fragments. The ends extend a little beyond the junction of the legs of the staple and the body, so as to tilt the staple with forceps or elevator when it is to be removed. The advantages of direct fixation are the security afforded and the opportunity which it gives of massage and friction, so useful in keeping up muscular tone. Nails and staples are generally better than other methods of fixation, and they are useful in a wide variety of fractures.

Glass a Substitute for Lint in the Treatment of Granulating Wounds.—

AYMARD, J. L. A. *Lancet,* vol. clxix, No. 21 of vol. ii, p. 1468, Nov. 18, 1905.

Lint is objectionable as a dressing for granulating surfaces. The surface is irregular, and it soon becomes septic. Every time it is removed from a granulating wound there is some irritation, and not infrequently hemorrhage. As a substitute glass or celluloid has many advantages. A case is described of a crushing injury to the thigh which left a large granulating wound 9 by 5 inches. In some places the wound was shallow and in others deep. The whole wound bled freely and was painful when dressed. In places the wound presented the typical punched-out appearance, while in others there were overgrowing granulations. The wound was covered with a sheet of thick window glass cut one inch larger than the wound and smeared with carbolized oil. The edges were ground on an ordinary grindstone. The glass was placed firmly on the wound, and absorbent wool tucked under the edges to absorb the discharge. Then a light wooden splint was placed on the outside of the thigh. The whole was bandaged, using considerable pressure. The next morning upon looking through the glass it was observed that the wound looked remarkably well. The glass was removed without the slightest pain or hemorrhage, and the wound was found almost flat. The glass was cleaned and replaced; later a curved glass was substituted with advantage. The wound was kept level by the dressing, and new skin rapidly formed. At the end of three weeks the wound had healed perfectly, which was an unusually rapid result considering the size of the ulcer.

The advantages claimed for the glass dressing is a perfect leveling of the wound, doing away with the necessity of cauterizing overgrown granulations; painless dressing; absence of hemorrhage; rapidity of the healing process; an aseptic covering; and an extremely cheap dressing. Through the glass the wound can be examined without removing it.

Submucous Resection for Deviation of the Nasal Septum.—

HURD, L. E. *Medical Record,* vol. lxviii, No. 22, p. 853, Nov. 25, 1905.

The writer describes an operation which he considers preferable to the older methods of Asch, Gleason, Roe, and others for correcting deviations of the septum. The advantages of the submucous operation are that it gives uniformly good results, it does not require a general anesthetic, and the dressings are simple and painless. The indications for submucous resection are the same as those observed in the Asch or Gleason methods plus many cases that were formerly classed as spurs, but which are really deviations of either the cartilage or the bone or of both. There is no case inoperable

so far as the condition of the septum itself is concerned, but there are a few contraindications that, as a rule, would apply generally to any operative procedure. Advanced tuberculosis, any infective process on or near the nose, such as lupus or furunculosis, and constitutional diseases such as diabetes or active syphilis, should prevent the operation.

The procedure consists in incising the mucous membrane over the deviation in a curve with the concavity backward. The flap of mucous membrane and perichondrium is elevated, and the cartilage is scratched through with a curette until the mucous membrane of the other side is reached. This layer is then separated from the septum, and the portion of the latter forming the projection is excised with Ballenger's swivel knife. If bone must also be removed the author's special down-cutting forceps is used. The mucous flaps are allowed to fall together, and are kept in apposition for a few days by light packing. Proper cocainization of the parts is important, as the operation may take from ten minutes to an hour. Several of the special instruments invented by the author are described and illustrated. He believes that the operation will ultimately supplant the crushing procedures, though owing to its technical difficulties it may take time for it to be universally adopted.

The Spirochaeta Pallida in Syphilis.—

FANONI, ANTONIO. *New York and Philadelphia Medical Journal,* vol. lxxxii, No. 19, p. 944, Nov. 4, 1905.

After a historical résumé of the micro-organismal theories of syphilis and of the descriptions and early investigations upon spirochaeta pallida as a cause of syphilis, Fanoni gives full details of the technical manipulation required for the demonstration of the organism, and reports upon 17 cases studied by him. Of these, 15 were syphilitic, 2 were in the tertiary stage, and 13 in the primary or secondary stage; 2 were control cases. Spirochaeta pallida was found in 11 out of 13 cases of primary or secondary syphilis examined, but was absent in the 2 cases of tertiary disease in the 2 controls, and in 2 cases of secondary syphilis that had been treated for some time. Seven chancres were examined, in all of which the spirochaeta were found. They were also found in a hypertrophic and congested tonsil, in a case of secondary syphilis, the author believing this to be the first time that they had been demonstrated in the tonsil. They were also found in the inguinal glands, in papules, in condylomas, and in mucous patches. In three cases they were found alive in hanging-drop preparations.

Scopolamine-morphine-chloroform Narcosis.—

ZINKE, E. G. *Lancet-Clinic,* vol. lv, No. 19, p. 518, Nov. 4, 1905.

The writer has employed this method of anesthesia in thirteen cases. Each received 1/100 of a grain of scopolamine with 1/6 of a grain of morphine in each injection, one being made four hours, one two hours, and one just before the operation. During the operation chloroform was administered to secure complete relaxation. The operations varied from thirty minutes to two hours and twenty minutes. In all cases chloroform caused profound anesthesia in from three to five minutes. The amount of chloroform administered varied from five to twelve drachms. The injections failed to secure sleep in six cases. Sleep occurred after the third injection in three cases, and after the second injection in four. In seven instances the patient had no knowledge of the operation and of the time preceding it. In three cases there was vomiting before and after the operation, in four cases only after the operation, and in six cases no vomiting at all. Five cases suffered more

or less pain after the operation, and there was no abdominal rigidity in ten cases; it was slight in two and well marked in only one. In one case there was a decided change in the pulse-rate and the number of respirations; the former fell from 130 to 80, the latter from 26 to 18 per minute. The pupil was contracted in only three cases. In all the others it reacted to light. The face was flushed in nearly all instances. On the whole the writer has been favorably impressed with this method of narcosis. There was no period of excitement, every patient acted well, and the amount of chloroform given was comparatively small.

Spinal Analgesia in Shock.—

WAINWRIGHT, J. M. *Pennsylvania Medical Journal,* vol. ix, No. 2, p. 75, November, 1905.

This inquiry was undertaken to see if some more satisfactory plan could be devised for treating crushing injuries to the limbs which demanded amputation. Our present resources leave much to be desired. Often the cases have marked shock at the time they are seen, and to wait for a recovery from the shock may be disappointing. The recent work of Crile has shown that shock is principally caused by an overwhelming irritation of the sensory nerves. His method of nerve blocking is met by spinal analgesia, which was proposed in this class of cases by Lower in 1900. Chloroform or ether is capable of causing shock even without operation, and it has been shown that where the spinal cord has been anesthetized by cocaine or stovaine amputations may be performed without shock. Ether and chloroform are much more dangerous than has formerly been supposed, and in many cases of shock the administration of these anesthetics would cause death even without an operation. They should not be given where local or regional analgesics are practicable. Spinal analgesia has no higher mortality considering the cases in which it is used than other anesthetics, and by the recent modifications, in which stovaine is substituted for cocaine and adrenalin added, the dangers are greatly decreased. Spinal analgesia will probably never supplant the routine method of anesthesia, but surgeons should be familiar with its application, as occasionally cases will occur which can only be saved by its use.

The Treatment of Perforations of the Tympanic Membrane, with Especial Reference to the Use of Gutta-percha Tissue.—

YATES, D. G. *Medical Record,* vol. lxviii, No. 20, p. 777, Nov. 11, 1905.

The writer recommends the use of patches of rubber to be applied over the perforation, so as to make an air-tight joint, in the treatment of recent or long-standing cases of this injury. In applying a patch to the drum a piece of rubber is selected which is about twice the size of the hole to be covered. The canal and drum are thoroughly sterilized by syringing and mopping, and dried. If necessary, the edges of the perforation are pared or touched with nitrate of silver. The disk is carried into the drum by means of forceps or a cotton-tipped probe through a speculum, if small; without it if too large. It is then pushed into position and the edges pressed down firmly all around. No adhesive material is necessary. The rubber is most conveniently sterilized by keeping it in alcohol or other antiseptic for a few moments while other preparations are being made. The patch hastens the reparative process and at the same time effects an immediate improvement in the hearing.

The author sums up the advantages of rubber tissue used in this way as follows: (1) It is convenient, easily sterilized and applied. (2) It is flexible, remains in place for a long time, and requires no adhesive material. (3) In large perforations it has the advantage over the various forms of artificial ear drums in not

causing pain or irritation or setting up a discharge. It helps to heal at the same time that hearing is improved. (4) Healing is rapid, and the formation of scar tissue, which is likely later to give way or become the seat of calcareous deposits, is reduced to a minimum.

Somnoform.—

CHAMBERS, T. R. *Journal of the Medical Society of New Jersey,* vol. ii, No. 4, p. 106, October, 1905.

The writer believes that this substance is the best for short anesthesias and for office use. It contains six parts of chloride of ethyl, three and one-half parts of methyl chloride, and five parts of bromide of ethyl. As compared with ether and chloroform such a mixture is safer, and so far, though it has been extensively used, no case of death has been reported. It does not irritate the mucous membranes. An objection to somnoform is due to the difficulty in recognizing when the patient is under the anesthetic. The patient is apparently asleep, and the corneal reflexes are never absent. Nausea is rarely if ever present.

A Case of Recovery After Talma's Operation.—

STEMEN, G. C. *New York Medical Journal,* vol. lxxxii, No. 20, p. 1011, Nov. 11, 1905.

In November, 1904, the writer was consulted in a case of ascites due to cirrhosis of the liver. The patient had to be tapped every two or three weeks, removing each time from three to five gallons of fluid. In the operation the method advocated by Talma was followed. The abdomen was opened between the umbilicus and the ensiform cartilage, evacuating the accumulated fluid. The liver was rubbed with a nail-brush until there was a slight hemorrhage, and the peritoneal covering of the diaphragm was treated in a like manner. Five sutures of forty-day catgut were used in stitching the abraded surfaces of the liver to the abraded surface of the diaphragm. Five or six loops of omentum were then stitched to the parietal peritoneum, and they were also included in the sutures which closed the abdominal incision. The establishment of collateral circulation was slow, and the patient was tapped three times before it was complete. The accumulation of fluid in the abdomen became less, and in three months the patient resumed his occupation. The patient has gained about 28 pounds in weight and his nutrition is good. As yet only eight months has elapsed since the operation, and it is too soon to affirm positively that the recovery is perfect, but the results are sufficiently so to justify the operation in properly selected cases.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Pruritus and Allied Conditions Affecting the Vulva.—

MCCANN, F. J. *Clinical Journal,* vol. xxvii, No. 5, p. 76, Nov. 15, 1905.

Pruritus is a symptom and not a disease, and one of its most important causes is eczema, though the effects of the latter as a cause and sequence must be distinguished. A common cause of pruritus is smegma, as well as pediculi or other forms of uncleanliness. Such conditions are readily corrected. A common condition associated with pruritus is the presence of tender spots. When these are touched the patient will often say that they are the cause of the pruritus. The best treatment is the application of pure carbolic acid or tincture of iodine to the tender spot. After the use of carbolic acid or the actual cautery a simple ointment should be employed. A large group of cases of pruritus is associated with alterations in the urine due to the presence of sugar or hyperacidity. The latter is a much more frequent cause. Every case of pruritus should have the urine examined. The itching in diabetes may be very severe. In such cases opium

may be employed. It is probable that the dietetic treatment will not greatly influence the pruritus. Locally nothing is better than the sulphuret of potassium, 10 grains to the ounce of simple ointment. This will often cure the pruritus even when the diabetes is not lessened. For a hyperacid urine alkalies should be administered internally, and locally an ointment containing carbonate of bismuth 10 grains to the ounce. The carbonate of bismuth is an excellent preparation in all cases of irritation of the vulva, and it is very useful in cases of urinary fistula. It may be employed in the form of an ointment, paste, or made with glycerin or with castor oil, rubbing up as much bismuth as the castor oil will take up.

Cases of pruritus of the vulva occur in which no local changes can be found, they seeming to depend upon nervous irritation. Every case should be carefully examined, and it will be found those without local changes are decidedly exceptional. The most sensitive area of the vulva is just where it joins the vagina. If this ring of tissue be carefully examined, it will often be found cracked, fissured, or presenting tender spots. In such cases no local applications to the vulva will be of service; they must be applied to the lower part of the vagina. In using carbolic acid, which may be employed in the strength of 1:20, strips of lint should be saturated having a length of about three inches. These should be introduced into the vaginal orifice, and they may be left over night, such an application often affording the first relief. The local effect of the carbolic acid can be supplemented by daily applications of boracic wool. This gives off a fine powder of boracic acid. The further local treatment consists of the use of bicarbonate of bismuth ointment, which should be made up with lanolin. Cases not relieved by carbolic acid may be improved by an application of chloroform, 1 drachm to 1 ounce of olive oil, applied with a camel's-hair brush. Another useful ointment is unguentum conii, to which 30 minims of purified creosote has been added. Local remedies such as sitz baths, to which bicarbonate of potash has been added, are useful. General treatment may be necessary, such as rest and diet, and the patient should not take alcohol. The bromides are sometimes useful as general sedatives. Cases which are not relieved by medical treatment may require surgical intervention. In such cases it may be necessary to excise the mucous membrane of the vulvovaginal junction.

Top Milk Mixtures.—

GITTINGS, J. C. *Journal of the American Medical Association,* vol. xlv, No. 23, p. 1722, Dec. 2, 1905.

Good results in infant feeding can be obtained with the use of the top portion of good ordinary milk bottled under fair hygienic conditions. A little personal investigation of one or more dairies will often enable the physician to recommend a useful product at market rates. The excessive variation of the fat content is largely compensated by the necessary dilution. The proteid is much less likely to be variable, and while the percentage of this and of sugar decreases as that of fat increases, for practical purposes allowance need only be made for this when we use 13 or 16 per cent cream. Certain other matters are just as important as the strength of the milk. The proper interval of feeding should be more strictly adhered to than the amount or strength of the mixture. Save in exceptional cases, such as illness, etc., the following rules may be advocated: During the first two months of life the interval between feedings should be two hours; during the second two months two and one-half hours; after the fourth month the interval should be three hours. The amount given at different ages may be approximately stated as follows: First week, 1 ounce; second and third weeks, 1½ ounces; fourth week, 2

ounces. From the second to the seventh month, inclusive, the amount of mixture in ounces varies from the number of the month to one in advance of it; for example, third month, from 3 to 4 ounces; fifth month, from 5 to 6 ounces, etc. It rarely will be advisable to give more than 8 ounces at one feeding.

As regards the strength of the milk mixture it may be assumed that the average healthy infant can digest whole cow's milk at the age of from 8 to 12 months. Some can do it earlier, and others will be unable to digest whole milk at any time during the first two years of life. The first three months is the crucial period when mistakes are most frequently made, and during this period the strength of the first milk mixtures should be: fat, 1.5 to 2 per cent; sugar, from 4 to 5 per cent; proteid, from 0.5 to 0.75 per cent. By the third or fourth month the fat should have been increased to from 2.5 to 3.5 per cent; sugar to 6 per cent; and proteid to from 1.5 to 2.5 per cent. From the eighth to the twelfth month the full strength of whole milk should have been reached. The cardinal points to be noted are the condition of the child's digestion, the gain in weight, and the appetite. The importance of frequent (biweekly or weekly) weighing is emphasized; a healthy child should gain from 5 to 7 ounces a week during the first four months of life, from 3 to 5 ounces during the fifth, sixth, and seventh months, and from 2 to 4 ounces from the eighth to the twelfth month. A knowledge of the strength of top milks is requisite; the upper 16 ounces of average milk (4 per cent fat) contains approximately 7 per cent fat; the upper 11 ounces, 10 per cent fat; the upper 8 ounces, 13 per cent fat; and the upper 6 ounces, 16 per cent fat. The proportion of proteid to 7 per cent cream is about 2 to 1; in 10 per cent cream, 3 to 1; in 13 per cent cream, 4 to 1; and in 16 per cent cream, 5 to 1. In the whole (4 per cent fat) milk the ratio is about 1 to 1. The sugar content is more constant, averaging near 4½ per cent. With these figures the proportions of different milk mixtures are easily calculated. The amount of sugar needed for the proper nourishment of an infant is from 5 to 6 per cent, and to supply this in the mixture it should be added to the diluent in proper proportion. The instructions given on these points are detailed, and a list of formulas is appended.

Subtotal Hysterectomy for Fibroids—The After Histories of Sixty Cases.—

DORAN, A. H. G. *Lancet,* vol. clxix, No. 19 of vol. ii, p. 1310, Nov. 4, 1905.

The writer gives an exceedingly interesting analysis of the postoperative history of sixty cases of subtotal supravaginal hysterectomy for fibroids. In every instance the patient had not reached the menopause, and the history for two years subsequent to the operation was known. A faulty method of recording these operations is to write cure after every case that has recovered from the immediate effect of the operation. A successful surgical case may not be a cure from the patient's standpoint. The tumor is gone and its removal has not involved the sacrifice of the patient's life, but certain discomforts may remain. The object of this study was to ascertain how far patients receive lasting benefit from subtotal hysterectomy; how far they were liable to certain discomforts; and how far the preservation of more or less ovarian tissue may save them from those discomforts. Where a small fibroid exists that is not growing and does not cause hemorrhage, an operation which practically sterilizes the patient should not be used. Under some circumstances removal of a fibroid uterus is demanded, so that certain possible discomforts must be risked. The writer's statistics confirm the value of retaining a certain portion of ovarian tissue. It is good to save one ovary provided it is healthy. Should both ovaries be diseased they must

come away. The annoyance of premature menopause is slight, and the chances of grave mental disturbances are small compared with the dangers of a suppurating tube or ovary or the development of an ovarian cystic tumor.

The theory has been advanced that it is of little or no avail to preserve ovarian tissue unless some endometrium is preserved as well. Abel and Zweifel found that when the body of the uterus was amputated an entire atrophy of the ovaries always followed, so that within three years troublesome menopause symptoms set in. The results in the writer's sixty cases are in favor of subtotal hysterectomy after an operation, and they decidedly favor the conservative treatment of the ovaries, or more correctly of ovarian tissue. They tend to support the Abel-Zweifel theory, which is carried out where the uterus is amputated above the os internum, and the patient so far as possible is saved from the disadvantages of an artificial menopause. In some of the writer's cases in which the amputation was made above the internal os, and in which the tissue was saved, the desired result did not occur, but this may have been due to the fact that the endometrium left behind was so disorganized by disease or damaged in the operation that its function was no longer continued. In two of the writer's cases menstruation was maintained without the aid of the ovaries.

Typhoid Fever in Children.—

BUTLER, W. J. *Journal of the American Medical Association,* vol. xlv, p. 1468, Nov. 11, 1905.

A clinical analysis of 210 cases of typhoid fever in children is given. The duration of symptoms before coming under observation averaged seven days. In 107 cases in which the condition of the bowels was ascertainable 69 had diarrhea, 31 constipation, and in 7 the bowel movements were irregular. Nosebleed occurred among the preliminary symptoms in only 29. After coming under observation anorexia and furred tongue were the rule. Vomiting occurred in 28 cases, in 13 of which it had been present during the onset; in many cases it seemed to precede more serious symptoms or complications. In 184 patients accurately noted as to this point, constipation existed in 100 and diarrhea in 84. No special prognostic significance is to be attached to this symptom. Tympany of varying degrees was usually present after the first week, and in some cases it was an annoying symptom extending into convalescence. The spleen was palpable in 134 out of 148 cases examined. Roseola was found in 115 of the 210 cases seldom before the sixth day of the disease. It was usually absent in the mild and abortive cases. Epistaxis occurred in 12 cases with repeated bowel hemorrhages, terminating fatally. The average duration of temperature in all cases was 17.3 days. The disproportion between pulse-rate and temperature first noticed by Roger in adults holds good for later childhood, but in very young children they run more or less parallel. A dicrotic pulse was seldom found. The Widal test was made in 96 cases, with 86 positive results. Nervous symptoms, such as headache, drowsiness, and delirium, were rather frequent, and there was generally some dulness or apathy. Relapses seemed to be more common in children than in adults, and they occurred in 31 of the 210 cases, 5 of which had a fatal termination. The mortality was 5.2 per cent. Ocular paresis occurred in one case, in several there were meningeal complications, and in two cases neuritis occurred after relapse. In some of the severer cases myocardial involvement was present. Intestinal hemorrhage occurred in 13 patients, of whom four died, one from perforation occurring after the hemorrhage.

The treatment was symptomatic and hygienic: Milk diluted for infants and very young children, with albumen water and the

usual cereal gruel diluents such as barley water and rice water as drinks. Care in diet during the early part of convalescence is as important as during the height of the attack. Tubbing was used in practically all cases, the temperature being the usual guide to its use, also the nervous symptoms, which it seemed to benefit. In very severe intoxication high enemas of salt solution were used with advantage in increasing elimination, especially renal. Two of the four patients with perforation were operated on, but all died.

Non-operative Gynecology.—

McNUTT, S. J. *Medical Record,* vol. lxviii, No. 20, p. 771, Nov. 11, 1905.

When operative procedure is indicated and there is neglect to give the patient the benefit of such procedure, the gynecologist in charge is recreant to duty; nevertheless many cases with pelvic or abdominal disease may recover under medical treatment without operation. The cases calling most urgently for operative treatment are those of pelvic or abdominal tumor, the accidents of childbirth, malignant disease, and pus collections. In order to deal successfully with the non-operative cases one must realize that while the patients present themselves for gynecological treatment, many of their symptoms are not purely and exclusively gynecological, but of reflex origin. While the local conditions must be treated, the local measures adopted will be more effective if combined with a careful consideration of the general condition. The most frequent general symptoms are the derangements of secretion and excretion, anemia, and nervous symptoms. The most frequent local conditions are (1) displacements of the uterus, with or without displacements of the adnexa; (2) catarrhs, acute, subacute, and chronic, confined to the uterus; and (3) the same, with extension to the tubes and secondary involvement of the ovaries. In many cases one can use local treatment indefinitely and utterly fail to cure the patient if with it does not go general medication and hygiene. This includes diet, clothing (few women dress properly), and carefully regulated out-of-door life, with some interest to divert the mind from introspection.

Dilatation and Curettement for Dysmenorrhea.—

HOLDEN, G. R. *American Medicine,* vol. x, No. 19, p. 776, Nov. 4, 1905.

This operation has been performed over 200 times at the Johns Hopkins Hospital, and the postoperative histories are complete in 95 of these. The information in most cases was obtained by letters, and the period of time after the operation varied from one to twelve years. Dysmenorrhea may be primary or secondary. In primary dysmenorrhea the pelvic organs are either normal or poorly developed. In secondary dysmenorrhea marked pathological changes are present in the pelvic organs which are the cause of the dysmenorrhea. It may be due to pelvic inflammatory disease, retrodisplacement of the uterus, or myomas, especially the submucous variety. Primary dysmenorrhea often dates from debilitating illnesses, and is apparently caused by anemia, malnutrition, and neurasthenia. In 40 per cent of all cases of dysmenorrhea in which the pelvic organs are normal or merely poorly developed successful results may be expected from dilatation of the cervix and curettement. By a successful result is meant complete or marked relief from dysmenorrhea for a year or more, with or without subsequent return of the trouble. No relief is to be expected in 30 per cent of the cases, and the relief in the remaining 30 per cent varies in degree and duration. The presence of anemia, malnutrition, or neurasthenia does not mean a bad prognosis after dilatation and curettement, but to obtain a successful result from the operation

these conditions must be rectified. If the patient's general condition is not improved little relief will be given by the operation. The prognosis is better in those cases in which the pains begin the day before or coincident with menstruation, in which they are sharp in character, and last but a day or two. The prognosis is worse where the pains begin several days before the flow begins, are dull in character, and last for several days. The operation should be preceded by a careful examination under ether. If the organs are not normal the prognosis is worse.

When the history points to inflammatory trouble, even though none can be recognized at the examination, its possible existence should be carefully considered. If in such cases an exploratory laparotomy is not thought advisable, it is best to limit operative procedures to dilatation of the cervix and omit curettement. In dysmenorrhea recurring after a period of relief following dilatation and curettement the possibility of a new pathologic condition in the pelvis, such as a retrodisplacement, should be carefully considered. Poorly developed pelvic organs favor dysmenorrhea, and the chance of relief in these conditions by dilatation and curettement is less. Chronic endometritis is rarely present in cases of dysmenorrhea unless there is at the same time an inflammatory condition of tubes or ovaries. Chronic endometritis is rarely a cause of dysmenorrhea. There is no relation between dysmenorrhea and sterility. Their coincidence is accidental and has no significance.

Brachial Birth Palsy.—

CLARK, L. P.; TAYLOR, A. S.; and PROUT, T. P. *American Journal of the Medical Sciences,* vol. cxxx, No. 4, p. 67, October, 1905.

The writers conclude an exhaustive study with the statement that the laceration type of birth palsy is due to tension on the nerve trunks, which first rupture the nerve sheath and then the nerve fibers. The prevention of this serious lesion of the cervical nerve trunks rests with the obstetrician, who should not overstretch the child's neck in delivery. If the palsy persists, it is due to rupture of the nerve sheath with hemorrhage into its substance, followed by cicatricial contraction with organization of the blood-clot. The connective tissue presses upon the nerve bundles, preventing regeneration of the nerve fibers. In some instances the same result is accomplished by the turning inward of the perineural sheath upon the nerve bundles. In all cases there should be excision of the damaged area and suture of the divided ends, as soon as it is proven that spontaneous repair will not take place. In all cases such treatment as will prevent contractions and prevent deformities, and retain muscle tone in the paralyzed limb, should be systematically used until spontaneous recovery occurs or until operation is done. Traumatic neuritis is a contraindication to active treatment. The proper time for surgical interference is not yet definitely fixed, but it would seem that a year's delay before operation is undertaken would be about right.

Differential Diagnosis of Ectopic Pregnancy.—

WELLS, B. H. *Medical Record,* vol. lxviii, No. 22, p. 845, Nov. 25, 1905.

The writer first reviews the history of modern conceptions of this condition, which was but little understood until Parry's classical monograph appeared in 1867. He then discusses the differential diagnosis, adopting the following classification of the various forms of extrauterine pregnancy: (1) Early, unruptured; (2) early, with rupture and free hemorrhage; (3) early, with rupture and extraperitoneal bleeding and hematocele; (4) advanced, with living child; (5) near or after term, child dead. Under the first heading, abortion, ante- or retroflexion of the gravid

uterus, pyosalpinx, hydrosalpinx, ovarian cyst, and ovarian or tubal new growths must be excluded. The second group must be differentiated from attempted abortion, acute gonorrheal endometritis, rupture of a rudimentary horn of a bicornate uterus, rupture or perforation of stomach, appendix, or other abdominal viscus, and tumors of the ovary or tube with twisted pedicle. In considering cases of the third class, hematocele, pelvic inflammation and abscess, cornual pregnancy, and malignant disease of the tube or broad ligament must be eliminated. Cases of the fourth type may be tuboabdominal, or tuboligamentary or subperitoneal, and must be distinguished from normal pregnancy with a thin-walled uterus, or pregnancy in a rudimentary horn. Diagnosis of the fifth class is often difficult in the posterior ligamentary form when several months have elapsed since the death of the fetus, and malignant ovarian tumor, tuberculous peritonitis, and fibrocyst of the uterus must be ruled out. The differential aids in each category are described and their practical application pointed out.

Antepartum Measurement of the Fetal Head.—

Stowell, W. S. *Medical Record,* vol. lxviii, No. 19, p. 725, Nov. 4, 1905.

In measuring the fetal head the patient is placed in the ordinary dorsal position and the head is carefully palpated. If it is already engaged in the pelvis it is not practicable to measure it. The occipital and frontal poles are grasped between the two hands, and an assistant places the pelvimeter between the terminal phalanges of the middle and ring fingers of the examiner. A table is given showing the results before and after delivery in 41 cases measured in this way. In 28 instances the postpartum measurement of the occipitofrontal diameter agreed exactly with the measurements made through the abdominal walls before labor. In 11 there was an error of 0.25 centimeter and in 2 of 0.50 centimeter. A table is given which shows how much to deduct to obtain the biparietal diameter where the occipitofrontal diameter is known. The method is of utility, as it determines the nature of the obstetric operation to be practiced, and also determines in early pregnancy whether to wait for full term.

Citrate of Soda in Infant Feeding.—

Poynton, F. J. *British Medical Journal,* p. 1021, Oct. 1, 1905.

Last year the writer published a paper on the use of citrate of soda in infant feeding. His experience in the last twelve months encourages him to refer to it again, as he has found it exceedingly valuable in a large outpatient department and often useful in the better class of practice. The addition of citrate of sodium in the proportion of 1 to 3 grains to the ounce of milk alters the curds formed by the milk so that they become more digestible. The calcium salts which are also required in the nutrition of the infant are preserved. The method is particularly useful in weaning children, as in this way a more concentrated form of milk can be given. Among the poor the method is of great value because of its simplicity. It corrects milk dyspepsia and avoids scurvy. It is to be remembered that the substance is not antibacterial nor antitoxic. In severe gastroenteritis from food poisoning such a modification of the milk is inadequate. In occasional cases it will fail.

Cerebral Hereditary Syphilis.—

Butler, W. J. *American Medicine,* vol. x, No. 24, Dec. 9, 1905.

The nervous system is attacked by hereditary syphilis in a considerable proportion of cases, sometimes without cutaneous lesions, the disease remaining latent until puberty or later.

The pathologic conditions include cranial osteosclerosis, periostitis, meningitis, endarteritis, thrombosis, as well as atrophy, sclerosis, and softening of the cerebral cortex. The symptoms are recurring convulsions, severe headache, worse at night, and impaired intelligence. Later the epilepsy may disappear. Hemiplegia frequently develops, and the patients may become paralytic idiots. Partial motor paralyses, aphasia, and disturbances of the special senses may occur. Mental deficiency, occasionally congenital, usually develops at a later period of childhood. Prognosis is unfavorable unless the condition is recognized and treated in its early stages. Congenital syphilis should be vigorously treated with mercury during the prevalence of cutaneous manifestations, and when nervous symptoms develop, potassium iodide, or if this disagrees, iron iodide, should be added.

PUBLIC HEALTH.

The Action of Formaldehyde in the Preservation of Milk.—

CHESTER, FREDERICK D., and BROWN, THOMAS R. *Delaware College Agricultural Experiment Station, Bulletin 71,* August, 1905.

This investigation was conducted under the auspices of the experiment station in coöperation with the State Bacteriological Laboratory, the question having both an agricultural and sanitary bearing. The work is essentially experimental, and considers (1) the general effect of formaldehyde in retarding the souring of milk; (2) previous results on the aseptic and physiological action of formaldehyde; (3) the effect of different proportions of formaldehyde on the development of bacteria in milk; (4) study of the character of the bacterial flora found in milk containing formaldehyde; (5) practical considerations on the handling of milk involved in the present investigation.

The following conclusions are drawn:

With milks containing the same quantities of formaldehyde the time of curdling varied within rather wide limits, dependent upon the character of the bacteria in the raw milk, and upon slight variations of temperature.

With different milks containing different quantities of formaldehyde the amount of formaldehyde bore no exact relation to the time of curdling.

With milk containing 1 to 2000 up to 1 to 800 of formaldehyde there was a rapid decrease of bacteria during the first twenty-four hours, after which there was a slow decrease, until by the end of five days the milk was practically sterile, or contained only resistant spores.

With milk containing 1 to 5000 of formaldehyde there was a rapid reduction of bacteria during the first four to six hours, but continuing throughout the entire twenty-four hours, after which the bacteria continued to multiply, at first very slowly, then at a very rapid rate.

With milk containing 1 to 10,000 of formaldehyde there was in some cases a slight reduction in numbers during the first twenty-four hours, followed by a very slow increase, then by a rapid increase. In others there was a very slow increase from the start, followed by a very rapid increase.

With milk containing 1 to 20,000 of formaldehyde there was a slow increase during the first twenty-four hours, followed by a rapid increase.

With milk containing 1 to 40,000 of formaldehyde the initial and later periods of increase were not differentiated, but the rise of bacteria was rapid from the start, but much less rapid than in the case of untreated milk.

Milk containing 1 to 40,000 of formaldehyde kept two to three times as long as untreated milk at the same temperature, and with 1 to 20,000 four times as long.

When milk containing formaldehyde was kept at 25° C. (77° F.) there was a tendency on the part of the formaldehyde to restrain the development of the miscellaneous bacteria originally present in the raw milk, without a corresponding retardation of growth of the common lactic acid ferment (*Bact. acidi lactici*).

This bacillus developed slowly in milk containing formaldehyde in proportions as high as 1 to 5000, proportions sufficient to kill or entirely check the growth of other milk organisms.

Certain species of yeast were capable of growing in milk containing considerable proportions of formaldehyde, the yeast appearing first, followed by the lactic acid fermentation.

Milk kept at 10° C. (50° F.) and containing formaldehyde in proportions as high as 1 to 10,000 remained uncurdled for a long time, but showed a large development of forms commonly found in raw milk.

The restraining action of formaldehyde was much less marked at refrigerating than at ordinary room temperatures.

With the presence of formaldehyde in milk kept at 25° C. (77° F.) the harmless lactic acid bacteria were capable of growing better than other bacteria commonly found in milk. Hence the presence of formaldehyde combined with normal room temperatures is favorable to a harmless lactic acid fermentation, and unfavorable to a mixed fermentation, liable to render the milk unwholesome.

The presence in milk of small amounts of formaldehyde, not to exceed 1 part per 40,000, or one teaspoonful of 40-per-cent formalin per 15 gallons of milk, and the holding of the milk at temperatures between 60° and 70°, will improve its sanitary quality by preventing rapid and objectionable fermentations, and there is no reason to believe that in this proportion any marked injury could result to the person consuming it.

The Preservation of Milk with Formaldehyde.—

SCHAPS, LEO. *Zeitschrift für Hygiene und Infectionskrankheiten,* Bd. l, S. 247, May 19, 1905.

After consideration of the frequency with which formaldehyde is used for the preservation of foods in general, and a mention of Behring's idea that the addition of formaldehyde to milk interferes with the absorption of the corpuscular elements and immune bodies, thereby interfering with the nutrition and diminishing the resisting power of the animal, Schaps enters into an experimental investigation of the subject.

Unfortunately the results of his experiments lead to no definite conclusions as to the most important of the problems mentioned, and having shown that the formaldehyde diminished the total number of bacteria in the milk without interfering with the vitality of any tubercle bacilli it may contain, he gives a synopsis of a single case of an infant of 5 months and 20 days which was nourished with cow's milk containing an addition of 1:10,000 formaldehyde, and died in the course of five weeks. At the autopsy an old right-sided pleurisy, hemorrhagic external hydrocephalus, chronic leptomeningitis, follicular ulcerations of the duodenum, and a flat erosion of the ileocecal valve were observed. In spite of the other existing conditions the ulceration of the duodenum is attributed to the formaldehyde that had been added to the milk; and the conclusion is drawn that the addition of this preservative is not to be recommended in preference to other chemical preserving agents.

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EDITORIAL.

THE CONDITION OF PATIENTS AFTER THE REMOVAL OF THE VERMIFORM APPENDIX.

It has been assumed that the vermiform appendix was a vestigial structure and that it had no functions. It has been proposed, perhaps facetiously, to remove the vermiform appendix in early infancy, thus getting rid of a "magazine" of infection with its potential liability to explosion. Some writers have found a function for the appendix, which they say is abundantly supplied with glands which secrete a mucus which performs a useful function in the large bowel. The latter view has obtained so little vogue among practical surgeons that they do not hesitate to sacrifice the appendix in operations where other structures are involved, providing there is little or no additional danger incurred by the patient. The assumption that all patients are the better for having their appendices removed has not been the subject of critical investigation until recently. L. Jones (*Lancet*, Dec. 2, 1905) recently took occasion to study the cases that were operated on in St. George's Hospital during the years 1900 to 1902. The writer obtained information of 87 qut of 184 operated on. The later results are considered in reference to the kind of operation which was performed and the amount of peritoneal involvement, the first group of cases including those in which there was definite suppuration around the appendix which was removed during the patient's stay in the hospital. Of these there were twenty-two cases, twelve of whom were in perfect health at the time they reported more than three years after the operation. Three suffered from slight occasional local pain. In three there was some bulging of the scar, one was more constipated than formerly, and one was more flatulent. Two ascribed definite lesions to the operation; one of them complained of a double inguinal hernia which probably had nothing to do with the operation, while the other suffered unquestionably from a ventral hernia.

Of the patients whose appendices were not removed but the abscess was opened and drained, two developed acute attacks later which required the removal of the organ. Nine are in perfect health, six describe mild troubles which have not inconvenienced them seriously.

Sixteen patients were operated on during an acute attack, but before obvious peritoneal infection had occurred. Of these twelve were

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Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

in perfect health. In one case the scar was slightly tender on pressure, in two there was slight pain with some fulness in the scar, and in the fourth there was a definite hernia at the site of operation as large as a hen's egg.

Thirty-two were operated in a subacute attack or quiescent period. Of these twenty expressed themselves as being better in every way and much benefited by the operation. Nine could find some symptoms which they thought possibly due to the scar—four had noticed slight occasional pain on exertion or on coughing. One suffered from constipation, one from flatulent dyspepsia, another from tenderness in the scar, and three thought that the scar was more prominent than before.

It will be seen from a study of these cases that few of these patients suffered from any disturbance of the bowel which could be attributed directly to the loss of the appendix, excepting those who described flatulence and constipation. The majority of complications were associated with the scar, or in some way with the operation, or with adhesions. The cases serve to illustrate the importance of early operation in discussing the results from the standpoint of late complications and discomfort. The cases in which infection had not extended to the peritoneum and where there was no suppuration showed the best results, though the difference between the two classes of cases is not as great as might have been expected. The difference in this group of cases between those who had the wound closed immediately and those in which it was necessary to drain is not very striking, though there is a slight preponderance of good after-results in those that were not subjected to drainage. The study as a whole serves to emphasize the sound surgical doctrine that if one has to have his appendix removed the earlier it is done the better. Such a study as this deserves to be followed by a careful analysis of the subsequent history of cases of acute appendicitis which have not been subjected to operation, the number of recurrences, the amount of discomfort, and other conditions incident to the non-operative treatment. There are no reliable statistics of this kind, but they would be highly interesting. A source of doubt that is unavoidable in the study of non-operative results in appendicitis is a question of diagnosis. There will always remain a doubt in many of the cases which would prevent any accurate comparison between the two classes, as the diagnosis would always be certain in those cases which were treated surgically. Notwithstanding such a source of error a comparison of the two groups might be instructive.

TRAUMATIC APPENDICITIS.

So much misconception has resulted from the qualifying adjective "traumatic" as applied to certain diseases that it is with some hesitation that we use it as a caption for this article. Traumatic hysteria and traumatic neurasthenia easily descend into the ordinary railway spine, so that the term traumatic appendicitis may soon degenerate into the "railway appendix." That the appendix may be injured by direct violence no one will question, though the damage to more important organs will usually obscure that to the appendix. A more important question is the possibility of the ordinary appendicitis, that which is due to the activity of pathogenic germs, being set up by violence such as falls, blows on the abdomen, or similar violence which does not involve a destructive lesion of any of the abdominal contents. That violence may do this can scarcely be questioned, but that it is extremely rare is equally certain. Given an appendix that is normally situated, free from adhesions and healthy, it is hardly conceivable how other than extreme direct violence could injure it so as to cause inflammation. The circumstances are not always such as we have

named, as many appendices are on the verge of acute inflammation. Some are closely related with the iliac muscle and are bound down by adhesions, and the lumen is constricted—conditions, in fact, which will lead to an acute attack of appendicitis if anything happens to cause congestion of the mucous membrane so as to separate the cavity of the appendix from that of the cecum. We can readily conceive how violence under such circumstances might precipitate a potential attack.

In Kelly's work on the appendix and its diseases he has collected fifty cases in which appendicitis followed an injury. In forty of these it was definitely determined that there was a preëxistent abnormal condition of the appendix. In thirty of the cases there was an appendiceal concretion. Southam (*Lancet,* Nov. 25, 1905) reports four cases in which appendicitis followed an injury, and inferentially expresses a doubt as to the possibility of direct injury to a normal appendix. The relation of concretion to appendicitis is recognized, and the belief is stated that there is a damage to the mucous membrane of the appendix which leads to a rupture when violence is applied. He also says that it is possible that stenosis with a distended appendix containing mucus or a mucopurulent fluid may suddenly be ruptured by direct violence. His first case occurred in a boy of nine years, whose attack of appendicitis immediately followed a blow on the abdomen. The pain began the day following the injury, on the second day there was vomiting, and on the fourth day there was well marked evidence of general peritonitis. The appendix was inflamed and almost perforated at one spot, and contained a fecal concretion. A second case was that of a boy of seven years who while at play fell upon his abdomen. From the time of the fall there was abdominal pain, which became worse toward the evening of the same day. Then there were symptoms of general peritonitis. An incision was made over the appendix, and a large quantity of pus was evacuated. The appendix was not seen, the boy's condition being too grave to permit of any search being made for it. A third case was that of a boy 12 years of age who was unexpectedly pushed into a swimming tank so that he fell flat upon his abdomen in the water. Abdominal pain was immediate. He returned at once to his home, where he was confined to the bed, frequently vomiting. On the fourth day he was sent to the hospital. The symptoms gradually improved. Above Poupart's ligament on the right side a distinct induration could be felt at the time of his discharge three weeks later from the hospital.

The possibility of strain or sudden contraction of the abdominal muscles lighting up an appendicitis was shown in the case of a boy aged 15, who while jumping across a stream was seized with severe pain in the abdomen. The same evening symptoms of acute appendicitis developed. There was general distention of the abdomen with dulness in each flank over the region of the appendix. There was a slight increase of dulness. On the following morning the abdomen was opened and found to be full of pus. The appendix, owing to the serious condition of the patient, was not looked for, and the patient died twelve hours after the operation, but no necropsy was obtained.

THE OPEN-AIR TREATMENT OF DISEASE.

By "open air" is meant a practically perfect ventilation. That this can ever be secured in a house or hospital ward by any system of ventilation is doubtful. No system of forced draught will ever reach the perfect purity of the open atmosphere in favorable localities. As for the fallacies of the open window, that need only be compared with a space of smaller dimensions to realize the fallacy of expecting more than an improvement

on the ordinary house atmosphere by keeping one or even two windows open. If one would cut an opening in a starch-box having the diameter of about one inch it would correspond with the average room with a single open window.

The fresh-air cult, if it may be so called, is of comparatively recent development. Occasionally in times past it was noted that certain patients did well under an accidental enforced fresh-air treatment. During the civil war it was noted that wounded soldiers who could not be given hospital accommodations but were treated in tents did not have hospital gangrene, and that cases of typhoid fever did better in tents. The fear of the night air, which was generally thought bad, though night air is the only air there is at night, was sufficient to overcome any salutary lessons that might have been conveyed by these instances. Another fallacy was the notion that the fevered patient was likely to take cold, and that the latter would come from a draught.

A no less striking error, and one that is still widely prevalent, is that cold air is good air. Cold air may be quite as vitiated as warm air, and the country farmhouse with its unheated chambers may be even more deleterious to health than the overheated city flat.

Much ingenuity has been displayed in constructing dwellings for the tuberculous. In sanatoria all sorts of devices have been tried—the shack, tent, lean-to, veranda, placing the head of the bed out of a window, etc. Doubtless any or all of these may be of service in different classes of cases. Some constructions are radically defective in that they imitate an ordinary house. For the majority of cases in the early stages of tuberculosis the tent is the best. It has been severely criticized: some contend that a closed tent admits of only imperfect ventilation. This is only true when the duck or canvas is unusually thick and heavy; a 12-ounce duck will admit of perfect ventilation without any special device. The Tucker tent has a special arrangement for ventilation, and this can be constructed of extra heavy canvas, and it can be made to resemble an ordinary dwelling. It is more expensive than a lighter tent, and it is of no greater service.

It has been demonstrated that patients can live all winter in a tent in the latitude of Chicago, and the same observation has been made in Canada. Patients must be kept warm. This can be done by proper clothing, foot-warmers, and like means. They rapidly become accustomed to the lowered temperatures, metabolism is increased, and there is a corresponding improvement in digestion and assimilation.

The outdoor or fresh-air treatment has come to stay, and already tentative efforts are being made to use it in other diseases than tuberculosis. Many sick children are being treated in this way. Bronchopneumonia in children, that dreaded disease in which a draught was thought to be so deadly, has been successfully managed by having the patients out-of-doors. What it will do for the acute illnesses generally remains to be seen, but it is the opinion of the writer that the congregating of numbers of the acutely sick in large hospital wards will soon be done away with in great measure.

No more instructive experience was ever recorded than that of the seaside sanatoria of France for the treatment of children with tuberculosis of the bones and joints. A large proportion were found to recover without operation. This experience was repeated by W. S. Halsted, who expresses the utmost confidence in the continuous out-of-door treatment of surgical tuberculosis.

In view of the results achieved one may well doubt the wisdom of constructing the vast piles of brick and stone that are now the conspicuous adornment of our modern urban

philanthropy. How much better would the majority of these patients be in cottage hospitals in the country!—the buildings of lighter construction, with plenty of light and air. The patients would have a better chance even if the pathologic findings were less accurate, and the surgical dissecting less brilliant.

THE ETIOLOGY OF SYPHILIS.

No recent discovery in pathology has attracted more attention than the almost uniform presence of the spirochaeta pallida in syphilitic lesions. As time passed and numerous reports were made from different parts of the world, showing that the organism was present in nearly all unquestioned syphilitic lesions and was absent in non-specific ulcerations, the interest deepened. The discovery of the organism in the serum of blisters obtained at the site of syphilitic exanthemata and its recognition in the blood have still further stimulated interest in this organism. It will require the crucial test of cultivation and inoculation before it can be definitely stated that this organism is the cause of the disease. That there is a prospect of these problems being solved is apparent when the success of inoculation of syphilis is considered. The earlier experiments were made upon the small laboratory animals, cats and pigs. The results were quite inconclusive, as were also the extended studies upon inoculation in monkeys. In a few instances monkeys have been shown to be susceptible to the disease, but there is no uniformity about it, apparently in many of these animals the secondary phenomena not appearing. The demonstrations that were made in 1903 at the Pasteur Institute with apes are quite conclusive. They uniformly are infected with the disease, developing after a varying period of incubation a typical primary sore which is readily recognized by its clinical characters, and later there is an enlargement of the lymphatic glands and an exanthematous eruption. An even more convincing experiment was made in the successful transmission of the disease from ape to ape, the clinical manifestations not being materially modified. A gradation has been found in the various species of apes, showing that the susceptibility to syphilis and the ability to produce in them the full clinical manifestations of the disease was governed somewhat by their position in the developmental scale, those approaching more closely to the anthropoid type presenting the more typical clinical manifestations. It is obvious that the remaining step which is necessary to identify the spirochaeta pallida as the cause of syphilis is to cultivate it outside of the body and then to inoculate the anthropoid apes. The matter of cultivation may be exceedingly difficult, but it is fortunate that at this juncture the demonstrated susceptibility of apes to human syphilis has been placed on a sure foundation.

While writing the above lines word comes that at the meeting of the Pathological Society of London, December, 1905, Dr. Barratt had demonstrated the spirochaeta pallida in eleven out of fourteen cases of yaws. In unbroken yaws the pallida spiral occurred alone, while in the broken lesions the spirochaeta refringans and other intermediate forms were noted. At the meeting it was stated that yaws was distinct from syphilis, though that the two diseases might exist in the same individual was thought to be possible.

A careful opinion on the evidence so far accumulated shows that we are justified in assuming only that the quite uniform presence of the spirochaeta pallida in syphilitic lesions is a very interesting observation, but offers very little that is confirmatory of its causative relation to syphilis. The fallacy of relying on morphology and tinctorial reactions in the identification of the specific qualities of micro-

örganisms has been demonstrated so often that very little reliance can be placed on them. The gratifying feature is that the inoculation experiments of Metchnikoff together with this discovery bid fair to forward the discovery of the nature of syphilitic infection, the results of which will be scarcely second in importance to that of the discovery of vaccination or the tubercle bacillus.

HEREDITY IN TUBERCULOSIS.

Nothing illustrates the mutability of medical thought more than the rapidity with which the idea of heredity in the etiology of tuberculosis is gradually fading away. No tenet of twenty-five years ago was more firmly adhered to than the direct heredity of tuberculosis. Statistics showing the prevalence of tuberculosis in the families of consumptives were extensively compiled. The blanks of insurance companies always contained an inquiry into the possibility of consumption in the family history, which if it was betrayed in the answers was certain to lead to the rejection of the applicant. In many of the insurance blanks these questions are still retained, but medical directors do not attach the importance to them that they formerly did. An unraveling of the influence of environment and heredity in tuberculosis is practically impossible. A tuberculous father may have a tuberculous son, but this does not prove the direct transmission of the disease. As a rule tuberculous disease occurs in early life, and where it removes the head of a family it not infrequently alters the social status of the family and means poorer nutrition, early employment in factories, or a more unhygienic dwelling due to impaired earning capacity. In such a case the development of tuberculosis in the child may be as well the indirect consequences as the direct. The older writers referred to the frequency with which alcoholism was noted in the parentage of tuberculous patients. The deduction was made that alcoholism predisposed to the development of tuberculosis in the offspring. In these cases it is certain that it was a question of environment, altered social status, and unhygienic dwelling with early child labor that determined tuberculosis rather than any direct heredity. Such examples furnish an adequate idea of the relation of environment and heredity in tuberculosis, and how practically insoluble the question of environment and heredity is as applied to the study of family histories. The problem is further complicated by the question of infection.

Taking all these factors into consideration there still remains the question of hereditary predisposition or a heredity of lessened resistance to the disease. How important this factor may be it is impossible to determine, but that it has some influence can hardly be questioned. Certain families show a predisposition to the development of the disease where the conditions are such as to exclude environmental influences and direct contagion. Such cases show that there may be a hereditary want of resistance to the disease.

THE PHYSICAL ASPECT OF AMERICAN FOOTBALL.

The extensive discussion now going on in which the strenuous President has taken a hand has called forth numerous articles, the most important of which is by Nichols and Smith (*Boston Medical and Surgical Journal*, Jan. 4, 1906), on the physical aspect of American football. It has been claimed that the injuries for the current year are far more serious and extensive than they have been in previous years. Nichols and Smith doubt this. It has been claimed by some that the open style of play would result in fewer injuries.

B.J.C.D

This article negatives this conclusion, although perhaps the more serious injuries would be lessened. All kinds of fractures, sprains, and torn muscles and tendons are found in the list of injuries. The more frequent were shoulder bruises, synovitis of the knee, and sprain of the ankle, with broken noses. Injuries to the spine were common and concusssions of the brain were frequent, both during practice and in games. Perhaps the most significant statement in the article is the fact that but two games were played by the Harvard football squad during an entire season in which there was not a case of concussion of the brain. The writers say: "There were several noticeable features in these cases. Frequently the fact that a man had received a serious head injury was noticed by the surgeons from the side lines before it was recognized by the players. A player would automatically run through a considerable series of plays before his mates noticed that he was mentally irresponsible. The mental state of the players who had concussion was variable, some being highly excitable and hysterical, others merely confused, in a few cases being completely unconscious. In every case there was a certain loss of memory both previous and subsequent to the injury. The loss of memory previous to the injury varied from a few minutes to a week. In all cases there was a loss of memory as to facts occurring at variable times subsequent to the injury. It was common to hear a player ask if he had played the first or second half of the game. In all cases the loss of memory was greater at first than it was after a few hours. During the year 1905 a total of 145 injuries from football are recorded. These were of sufficient severity to require surgical attention, and no account is made of minor bruises."

On the whole the showing is a very unfavorable one so far as the game is concerned. There are many objections to it on other grounds than physical injury, the most serious being that it does not tend to that general development in athletics which should be fostered in educational institutions. The experience of the Harvard football team during 1905 with its record of only two games in which no concussion of the brain occurred is most significant. It is probable that moderate degrees of concussion may have no secondary consequences. Those with impairment of memory lasting for several days or a week cannot be looked upon as trivial accidents.

HUMAN ACTINOMYCOSIS.

This form of infection has been looked upon as comparatively infrequent, it not totaling very large in the hospital and health reports. That it is of more frequent occurrence than has been generally supposed has been demonstrated by the experience of the Presbyterian Hospital of Chicago. After the rule was adopted in that institution of having the pus from all infected cases examined microscopically the number of actinomycosis cases increased threefold. Actinomycosis or lump-jaw is a comparatively wide-spread disease in cattle. In the last Bulletin of the Chicago Health Department attention was called to the method of inspection employed at the stock-yards in that city. It was stated that actinomycosis was usually confined to the head. In these cases it is a localized disease, and it is sufficient to condemn the part that is involved. Where the abscess opens into the digestive or respiratory tract, or when the lymphatic glands are involved or there are tumors in the lungs, in such cases it is impossible to recognize all the foci of the disease, and the whole carcass of the animal should be condemned. The recognition of the danger of the ray fungus is most important from a public health standpoint, as the disease is far more wide-spread than is

generally believed. Many abscesses are opened and drained. If this is the only focus the disease is quite likely to be cured. If, however, it is spread along the lymphatics, the only chance for the patient is a thorough eradication of the trouble. The possibility of cure depends on its early recognition. It would seem that the rule adopted by the Presbyterian Hospital of examining all pus microscopically is most important, and house surgeons should never omit such examination.

THE COUNTY SOCIETY AS A POST-GRADUATE SCHOOL.

What a county society can accomplish when its members are united is shown in a letter from David J. Loring. The society in question is in a rural district and is not large. Its work began two years ago, and consisted in interesting every physician in the scientific and practical side of medicine. A room was rented, and each physician was required to act as a teacher of some special subject, while the others took the places of students. Anatomy and surgery was assigned to one, physiology and practice to another, and so on through the list of subjects, one fundamental and one practical branch to each teacher. The meetings were held twice a week. This plan of instruction proved very profitable, though the teacher derived greater benefit than the students, a difficulty that was obviated by changing the "faculty" from time to time. Not only were the members benefited scientifically, but the social amenities were practiced, with a resulting greater solidarity of the local profession. The regular scientific meetings of the county society were carried on, and in addition a new fee bill was adopted increasing the remuneration of physicians one-half. These advanced fees have been maintained, and with no complaint on the part of the public. Dr. Loring says: "In fact, the public seem to understand the necessity for the change largely for the reason that it knew we were making a heroic effort to give the people better service."

The rural physician is often envious of his urban brother, believing that he is more happily circumstanced, having the advantages of medical societies, the stimulus of coöperative effort, and opportunity for hospital experience. It is obvious that a plan such as outlined by this rural county society would do much to obviate these inequalities. It would give an opportunity for the interchange of experience, the observation of cases, and the study of pathological material which would stimulate the interest of every one. An organization such as this would do much to supplement the occasional periods of postgraduate study.

ARTIFICIAL EXPIRATION IN AN ASTHMATIC ATTACK.

So far as we are aware no reference is found in the literature to the relief of asthmatic attacks by mechanical means. A. Morrison in the *Lancet* of November 25 discusses the mechanism and treatment of the attack in spasmodic asthma. His attention was first called to the matter by two cases in which he noted the inspiratory inflation gradually overpower the expiratory effort, leaving the patient's chest fixed and breathless. It occurred to him that it might be possible to aid the patients in overcoming this fixation of the chest by assisted expiration. Accordingly one hand was placed on the back and the other on the front of the chest. The air was squeezed out of the chest at the end of each inspiration. As the chest rose with inspiration the pressure was relaxed, and when expiration should have occurred the hand was brought down and the air squeezed out. Such a maneuver gave relief from the excessive sense of strain and stifling. In the

hands of nurses Morrison has not found this procedure so efficient, they not understanding quite so well the mechanism of respiration and what was necessary to be done. Nothing is claimed for the method beyond an amelioration of the attacks. During the past two years the writer has had frequent occasion to test the efficacy of this procedure, and in no instance has he failed to improve the breathing of the patients and to relieve the oppression. The simplicity of this method commends it. The wonder is that it has not been practiced before or that it has not been mentioned in the text-books.

SPINAL ANALGESIA AND RECTAL SURGERY.

Injections of cocaine into the subarachnoid space are not as popular as they were a year or two ago. Like every new method it was extensively tried, found a few enthusiastic advocates, and then because of some real dangers it fell into comparative disuse. Later the method will be revived, as it will be found to have distinct advantages in selected cases that will outweigh the disadvantages. In our abstract department we recently referred to it in cases of operation on the bladder and prostate in individuals whose health is so far impaired or kidneys diseased that a general anesthetic would have added immensely to the dangers of the operation. Naugebauer (*Centralblatt für Chirurgie,* No. 24, 1905) has recently employed medullary cocainization in seventy-nine cases of operations upon the rectum and anus. He calls attention to the remarkable influence which this method has upon the contractility of the rectum. The structure becomes very much relaxed, and the mucous membrane of the lower half of the rectum can be readily inspected. This relaxation occurs in the wall of the rectum rather than in the sphincter, but the tone of the latter is so far lessened that it readily dilates under moderate pressure of the finger. This local effect on the musculature of the rectum is considered by the writer to be of the greatest value in operations on the lower segment of the bowel. Hence this method of anesthesia commends itself in cases of surgical intervention in this part.

HEMOLYSINS IN PATHOLOGY.

There is something suggestive in the whole subject of hemolysins, and the possibility of making these reactions serve a useful purpose in pathology and possibly in the clinical study of disease. Ruffler and Calvocoressi in the *British Medical Journal* of November 25, 1905, describe a hitherto unrecognized change in the urine in cases of nephritis. In previous experiments they determined that the injection of human urine into rabbits produced a serum which had the power of dissolving human red blood-corpuscles. Their results with the secretion from healthy kidneys were invariable, but in a study of the urine from patients suffering from nephritis the results were not the same. Only one patient out of sixteen produced a strong hemolytic serum, while four patients produced weak hemolytic serums, and in eleven the blood possessed no hemolytic power. In each instance control observations were made with healthy urine, and in each instance a strong hemolytic serum developed. The only conclusion which the writers feel justified in drawing is that the physiological action of urine in cases of diphtherial nephritis is altered from that observed in healthy human beings, but no inferences are drawn from this simple fact.

ORIGINAL ARTICLES.

TUMORS AND CANCER AMONG THE BUSH NATIVES OF ANGOLA.

BY F. CREIGHTON WELLMAN, M.D., BENGUELLA, W. AFRICA.

[Published under the auspices of the American Society of Tropical Medicine.]

Although I have been for some time interested in the study of the neoplasms met with in the colony of Angola (and have on two different occasions drawn attention to the fact of their scarcity), my attention has been specially drawn to the matter by a recent communication from Professor Scheube, who is collecting material for a statistical study of cancer in the tropics. While looking over my notes on the subject in order to supply Dr. Scheube with what exact information I possessed, it occurred to me that perhaps a short account of my observations might be of interest to those engaged in the investigation of the question at home. The notes are made as brief as possible. I have made drawings of my specimens of the few growths examined histologically, and sent sections of each to the secretary of the American Society of Tropical Medicine.

FIG. 1.—Bantu man with keloidal fibroma pendent from lobe of ear.

Sarcoma.—Only two cases seen, both in young women. The decision in these cases rested on the clinical features only, as no operations were done, and the diagnosis was therefore not verified by the microscope.

FIG. 2.—Section of keloid, low power, to show process of formation.

Fibroma.—This type composes almost the entire bulk of new growths seen here. The following kinds are encountered:

1. Multiple fibromata (painful subcutaneous tubercles). One case, which is being published.

2. Keloidal fibromata. This form comprises the vast majority of instances. It is quite often seen, the native seeming to have a tendency to growths of this character. Scars from burns, tattoo marks, etc., often result in keloidal formation. The case shown states that his came from piercing the ear for earrings. His-

tologically I can see no difference between keloid and the ordinary fibrous tissue seen in various growths.

I was interested to read lately a statement of Mallory[1] which confirms me in this opinion, which I had expressed in two previous communications. He says: "So far as can be judged from a single case, the fibrils in a keloid do not differ from those in a fibroma. The tissue resembles young, actively growing tissue of inflammatory origin."

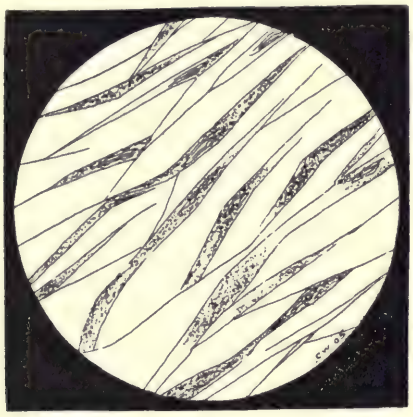

FIG. 3.—Portion of section seen in Fig. 2 under high magnification to show character of tissue.

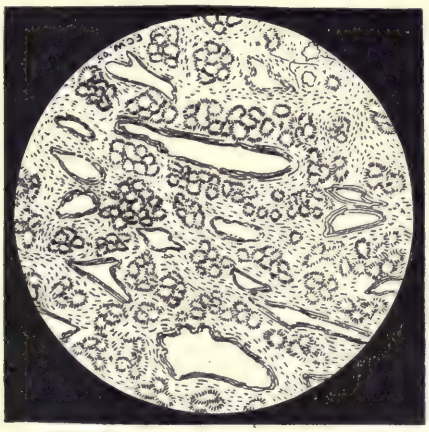

FIG. 4.—Section of nasal polypus (magnified).

This opinion of Mallory's is based on a minute study of the fibroglia fibrils of the tumor, and renders unnecessary the confusing distinctions suggested by LeDantec and Boyé and some other tropical observers.

Myxoma.—With the exception of a single case of nasal polypi I have seen no example of this type of tumor.

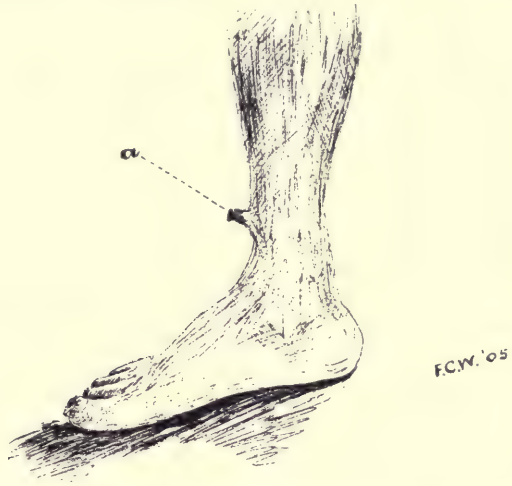

FIG. 5.—Leg of Bantu girl showing cutaneous horn (*a*) on the shin.

Chondroma.—One case which I saw was probably chondroma of the lower jaw. The diagnosis was only made clinically, as no operation was allowed.

FIG. 6.—Bilharzial papilloma of the rectum, showing ova of B. hæmatobia *in situ*.

Papilloma.—Are seen, but are rarely of any importance. Three kinds have been noticed:

1. Warts. About as common as in other countries.

[1] *Journal of Medical Research*, xiii, 2, p. 132.

2. Cutaneous horns. Not rare. Sometimes they give the patient a weird aspect. The natives say that if they are knocked off they give rise to incurable sores, but I have never seen a case of this kind.

3. Bilharzial papillomata. While bilharziosis is comparatively common in Angola, it is for some unknown reason nearly always of a mild character and rarely results in the formation of new growths, so common in Egypt. I have seen but one marked case of papilloma of the rectum, which I excised and examined microscopically.

I might add to the above notes that I have seen several small benign growths, probably lipomata. I have also noticed a few small exudation cysts, the discussion of which is not exactly in place here. I have excluded for the same reason mention of hydrocele, which is not uncommon, as well as that of goitre, permanent enlargement of the spleen from malaria, different enlargements arising from filariasis, and various unclassified hypertrophies.

In conclusion it is not necessary to point out again the happy scarcity of malignant new growths among the Angola Bantus. When it is remembered that these observations have extended over several years, and that my official duties include the examination of large numbers of natives every month, the paucity of important neoplasms among this people as compared with civilized nations becomes very striking.

ELEMENTARY PRINCIPLES OF METABOLISM.

BY JOSEPH MC FARLAND, M.D., PHILADELPHIA.

An ameba or other unicellular organism is usually selected as the prototype of elementary function and structure, its apparent simplicity of organization and its independence supposedly making it an easy object for study and consideration. As a matter of fact, however, the simplest organisms known to our microscopic lenses have structural complexity of which we know but little, and physiological capabilities about which we know nothing. To resolve protoplasm to its component chemical elements, to show from what compounds its various atoms and atom groups are obtained, and to learn what changes take place in the compounds acted upon in the dissociation and appropriation of these atom groups, is to learn only *what* takes place but not *how* or *why;* and it is discouraging to pursue at length these questions of *how* and *why,* as there seems to be no single point upon which we can declare that our information is complete and our position secure.

Unicellular organisms either live by the assimilation of matter already in an absorbable condition, or upon non-absorbable matter which they must first ingest and digest and render assimilable. In the first case the organism has the appearance of being passive. It finds itself in an environment of assimilable matter and proceeds to respond according to fixed physical and chemical laws. Given a certain density, a certain temperature, the presence or absence of certain salts, and a given length of time, and chemical changes take place by which the living entities have increased in size and number, and the environing medium altered in composition. It is an inevitable reaction initiated by the vital organisms present. Dead organisms of the same kind cannot achieve it—it is vital, and the activity of the living thing has brought it about. In the second

B. J. C. D.

case the organisms concerned seem to be more active. The living cell—amebæ, ciliates, certain flagellates, etc.—now finds but few of its wants supplied by substances dissolved in the medium in which it lives, and must move about in search of food. As it comes in contact with one after another of the objects of the external world, it must differentiate between those suitable and unsuitable for its purposes, must succeed in taking them into its substance, must act upon them through the medium of precious enzymes, transform the useful substance into utilizable substance, appropriate this to its uses, and get rid of the effete matter remaining. Truly this appears to be a complex and complicated matter, but it is in reality no more so than the other, being resolvable into phenomena ultimately physical and chemical.

Chemical affinity of a variety known as chemotaxis guides the cell to the matter suited to its needs, and the chemotactic force usually fulfils its purpose with definiteness and certainty, though sometimes it makes a mistake and leads the cell to load itself with substances unfitted for its uses—here we see the beginning of conditions which in the progress of our argument we will find explaining some of the morbid conditions of the higher animals. The death of living ingested or incorporated particles and the final dissolution of both living and non-living particles are accomplished through the action of chemical substances—enzymes—of the cells. The final assimilation of the transformed products depends upon opportunities for molecular combination presented by changes in the chemical condition of the cell resulting from the wear and tear incident to its activity—all distinctly physical and chemical phenomena, but all incidental to the living state, and all anabolic or constructive in nature. Dead cells behave differently. Their molecular condition must afford as many possibilities for chemical combination as we observe in living protoplasm, but so soon as death occurs the whole process changes, the conditions are reversed, catabolism becomes the rule, and the complex molecular structure of the protoplasm is analyzed to lower and lower combinations until only binary compounds remain. Cellular nutrition takes place in response to stimuli external to the cells themselves, and may be initiated or inhibited either by natural conditions or by experimental manipulations. Thus by imitating the unfavorable conditions that arise in nature we can, in the laboratory, cause amebæ to move actively about in search of food or to encyst themselves in an inactive form during which function is suspended.

In the metazoa, or animals composed of many cells, the same general conditions obtain. Both forms of nutrition, that by the absorption of assimilable matter and that by the transformation of originally non-assimilable matter, may be observed, though variations occur according to the increasing complexity of structure and the diminishing opportunity for independent cellular action. In animals of lowly organization (hydra) the cells lining the primitive intestine are actively phagocytic and readily take up any appropriate minute bodies within reach, digesting them in their own substance as the ameba does, as well as in the tube into which their enzymes are poured. Thus the cells are able to absorb assimilable matter resulting from the digestion of non-assimilable matter in the intestine, at the same time that they are digesting organized particles in their own bodies. In such animals the absorbed assimilable substance seems to be directly handed out from the actively digesting cells to their less active neighbors who are engaged in defending them, or in making those movements by which the nutrient matter is caught and brought to the alimentary canal. Here we see the first division of labor—*i.e.*, certain cells whose function is digestive and certain cells whose function is defensive or procurative. The digestive cells functionate for both groups, and

though in the lowest of the metazoa any of the cells may, under abnormal conditions, take on the digestive function temporarily, it is only until natural conditions are revived or a new division of labor instituted—as when a hydra is inverted and the protective cellular layer becomes the digestive layer and a new division of labor is effected.

In this primitive division of labor the activities of all the cells depend upon the successful activity of the digestive cells. If they cease their labors the others suffer, and if their specialization is such that they can no longer perform any digestive function for their own independent nutrition, they must die. But in this division of labor in which assimilable substances prepared by one cell are directly imparted to another cell we must imagine a new factor, *hunger* of the outer cells, making its appearance. This hunger is nothing more than necessity for molecular integration, and when experienced by the outer cells can be directly transmitted to the inner digestive cells, stimulating them to activity. It is not inconceivable, indeed not improbable, that in the absence of other available matter these hungry outer cells draw upon the inner cells themselves, and drain them of their reserve stuffs, so that the necessity for reintegration although first experienced by the outer is now doubly experienced by the inner cells, which are stimulated to heightened activity to supply the double need. Here we find another fundamental principle of nutrition as we see it in the higher animals, the response of certain groups to fulfil the needs of other groups of cells. As the structure of animals becomes more and more complicated as we ascend from the lowly to the highly organized, so the cellular interdependence increases and the independence diminishes. The component cells are no longer able to maintain themselves, but must be maintained by or at the expense of others, and these in turn by still others, until the complexity becomes bewildering. Groups of cells isolated to form organs receive their nourishment, perform functions sometimes obvious, sometimes unknown, and do so in response to stimuli the nature of which we scarcely suspect.

Let us briefly outline the more obvious of these reactions before we attempt to contemplate those whose nature we may call occult. In the higher animals, so soon as the available assimilable nutrient supply of the cells falls below a certain level hunger is experienced, though there still remains enough available material to tide the animal over a considerable period, during which it can secure food and set the digestive function at work, transforming it to assimilable material before the cells begin to live at the expense of one another. The food being found and ingested, successive stimulation of the salivary, then of the gastric, then of the intestinal mechanisms takes place with resulting secretion of enzymes, through which the initial transformations of the foods are accomplished. These enzymes are prepared by the cells of the respective glands, but the large quantities present in the glandular secretions probably represent but the aggregate result of the activity of cells whose specialization leads to the excessive elaboration by them of active agents common to large numbers of cells. Thus the gastric, pancreatic, and intestinal cells all contain proteolytic enzymes in considerable quantities, but nearly all, if not all, cells contain proteolytic enzymes in small quantities. We have come to look upon the secretion of these enzymes as the natural outcome of nervous innervation of the glands, and have given too little attention to other factors involved. Thus, taking the intestine as the best example because of the complexity of the digestive functions that take place in that organ, we find that the reflex nervous impulse occasioned by the entrance of food from the stomach into the duodenum is only one factor, for example, in the activation of

the pancreas, in addition to which we find that the action of hydrochloric acid upon the duodenal epithelial cells results in the formation of a body called *secretin,* which when absorbed into the blood greatly augments the function of the pancreas. So a *substance* produced in one organ and transported in the blood to another organ exerts a definite effect upon it. This is the first of many such effects to be pointed out.

With the entrance of the bile and pancreatic juice come a series of reactions between the cellular products and the food that are far more complicated than was thought a few years ago, and the full significance of which is not yet understood. If we only had time to go into the matter deeply we would find that the pancreatic *trypsin,* the most important and active proteolytic ferment of the body, for its maximum effect requires to be combined with *enterokynase,* an active product of the intestinal epithelium, as pepsin requires to be combined with hydrochloric acid. Moreover, there are certain proteids that for some reason escape transformation in the stomach by pepsin, to be acted upon in the intestine by trypsin, and there are other proteids that escape the action of both of these enzymes to be acted upon by cellular enzymes or to be absorbed unchanged. Sometimes this is the rule, sometimes it is the exception. Thus, venoms taken by the mouth are usually innocuous because the active poisonous principles they contain being proteid in nature are therefore subject to the pathologic action of pepsin and trypsin; but Fraser found that if cats and rats were given large doses of venom by the mouth, some was absorbed into the blood without change, and that frequent administrations of this kind might result in the production of immunity. The same is true of antitoxins. If diphtheria antitoxin is taken by the mouth it usually confers no immunity because it is destroyed by the proteolytic enzymes, but if large quantities are given, or if certain unknown conditions exist, it is absorbed and immunity is conferred. If it should be argued that the uncertain chemical composition of toxins and antitoxins makes it impossible for us to draw correct inferences from the experiments cited, it need only be pointed out that if large quantities of egg-albumen are consumed, some of it is absorbed unchanged, and that it may even be subsequently found in the urine. There is, therefore, a considerable qualitative and quantitative variation in the treatment of proteids, the nature of which is unknown to us, but which would seem to indicate (1) that there are various treatments of various proteids, and (2) that the digestive transformations familiar to us may be unessential.

When we come to follow the carbohydrates in their transformations we find similar variations. It is not the custom for nature to waste her valuable products or to perform unnecessary functions, therefore we must look with suspicion on the prevailing opinion that ptyalin and amylopsin are identical in action, and that the function of ptyalin is unimportant because the food is to meet the stronger enzyme later on in the intestine. We do not know that there is any difference between the activity of these enzymes, but we must not hastily assume that there is none. As every one knows, carbohydrate foods are ultimately transformed to maltose and levulose by *amylopsin,* but before entering the blood are acted upon by another ferment, *invertin,* by which they are transformed to dextrose—the sugar of the blood —but there are various forms of dextrose known, and perhaps others not known, which may require peculiar treatment. Sometimes this final stage is omitted, and levulose enters the blood in considerable quantities and may even appear in the urine.

The fats are treated very peculiarly. A part of them is acted upon by *steapsin* and split up into glycerin and fatty acids, both of

which may enter the blood as such or combined to form soaps, the former sometimes appearing in the urine; another and perhaps a major portion escapes this transformation and is taken up by the finger-like processes of the intestinal epithelium, forced into the interior of the cells, passed on to other cells, and finally to the lacteals. Seeing that all of the fat is not absorbed in the same manner, and that Ewald has observed the synthesis of fatty acids and glycerin to fats in the intestinal cells, it seems natural to infer that there are differences in the nature of the fats to account for these different treatments. Some of the transformations of the fats are no doubt effected for the purpose of making the fat that is to be absorbed into the tissues conform in composition to that peculiar to the particular kind of animal, for it cannot be true that the stored fats of the tissues are all manufactured from carbohydrates. Rosenfeld found that when dogs are starved until their stored fats were all consumed, and then fed upon sheep's tallow, it was absorbed unchanged, and that the sheep's tallow was deposited in the tissues as such. The undoubted difference in the nature of the proteids absorbed is further shown by the peculiar treatment which these substances undergo before finding their way to the tissues. Thus as they transfuse through the intestinal epithelium and capillary walls, certain of them are seized upon by *trypsin* and at once destroyed, with resulting leucin, tyrosin, and ammonia, while others finding their way to the liver meet with destructive transformations through the activity of its cells. It is most interesting to see that the chemical transformations effected by the cells upon absorbed products resemble those of the digestive juices upon the ingested food, differing quantitatively rather than qualitatively. To pursue these subtle changes further seems unnecessary; enough has already been said to show that the multifarious treatments to which each class of food products is subjected show each to be composed of numerous slightly different compounds whose varying structure is perhaps ultra-chemical. It may even be that these references to the primary changes in the process of nutrition have no place in an essay upon metabolism, but that is far from the truth, and starting, as we did, with cells that are compelled to select and prepare the nutrient substances for their own metabolic processes, we are obliged to investigate the means by which the higher animals prepare the nourishment by which the vitality and activity of their numerously differentiated cells shall be sustained, and see how groups of cells act collectively and harmoniously to prepare what other cells must finally act upon individually and according to their particular requirements.

We have glanced at the products of digestion as they are known to us, and have followed them to the blood. Let us now briefly glance at the blood itself. Here we have to do with a complexity that is almost infinite. There is a gross standard composition of factors known to us in the aggregate—of substances chemically demonstrable—and a varying composition of factors scarcely known to us, and demonstrable only by the most delicate physiologic reactions, and the ever-increasing number of these factors whose presence is so difficult to demonstrate leads us to the justifiable conclusion that beyond all these there are still other factors that we know nothing at all about.

Here are some of those constituents of the fluid blood whose presence can be more or less clearly demonstrated in healthy individuals:

Nutritive factors .....
- Serum albumin — probably an extensive group of closely related compounds with ultra-chemical differences.
- Serum globulin { Fibrinoplastin. / Paroglobulin.
- Sugars—Dextrose — numerous varieties of dextrose.
- Levulose—Glycogen?
- Extractives—natural fats — olein, stearine, palmatin.

- **Oxidative factors**.....Hemoglobin
  - Fatty acids.
  - Soaps.
  - Glycerin.
  - Cholesterin.
- **Coagulative factors**....
  - Fibrin factors—Fibrinogen.
  - Fibrin ferment—Thrombin.
- **Defensive factors**.....
  - Cytolytic amboceptors. Agglutinins and agglutinogens.
  - Cytolytic complements. Opsonins.
  - Alexins. Precipitinogens.
  - Antitoxins.
- **Enzymic factors**.....
  - Proteolytic—Trypsin. Pepsin?
  - Lipolytic—Steapsin, Lipase.
  - Glycolytic—Pancreatic ferment.
- **Metabolic factors**. .....
  - Urea antecedents
    - Carbamic acid—Ammonia Salts.
    - Amido acids, leucin, tyrosin, aspartic acid, glycocoll, lactic acid.
  - Uric acid antecedents—nucleins, lactates, etc.
  - Xanthine, hypoxanthine, guanin, and Creatin.
- **Inorganic factors**.....
  - O.
  - CO_2.
  - Chlorides—NaCl.
  - Phosphates—CaMg, etc.
  - Carbonates—Ca.
  - Sulphates.
- **Absorption products**...
  - Indol.
  - Skatol.
  - Phenol.
  - Cresol.
  - Bile salts.
  - Bile pigments.
- **Stimulating metabolic products—Internal secretions**.....
  - Pituitary.
  - Thyroid.
  - Parathyroid.
  - Adrenal.
  - Ovaries
  - Testicles.
  - Corpora lutea, etc.

Should the condition of the individual depart from the normal, a limitless series of new factors present themselves:

- **Infectious**.....Bacterial and protozoan—toxins, enzymes, lysins, aggressins, etc., in endless number.
- **Metabolic**.....
  - Acetone.
  - Aceto-acetic acid.
  - B. oxybutyric acid.
  - Xanthine.
  - Hypoxanthine.
  - Guanin.
  - Adenin.
  - Creatin.
- **Disintegrative**—Hemoglobin.
- **Defensive**.....
  - Agglutinins, anti-agglutins.
  - Precipitins, anti-precipitins.
  - Cytolytic amboceptors, anti-amboceptors.
  - Cytolytic complements, anti-complements.
  - Antitoxins.
  - Antienzymes, etc., etc.
- **Absorptive**.....
  - Indol.
  - Phenol.
  - Cresol.
  - Skatol.
  - Bile pigments.
  - Bile salts, etc.
- **Therapeutic drugs, in endless variety.**

The composition of the blood moreover varies in the portal, the pulmonary, the arterial, and the venous systems.

We must not, however, lose sight of the subtile nature of the cellular processes. To their normal stimulating agents the cells react definitely and uniformly, but so soon as any new form of stimulation is experienced entirely new reactions become manifested. Here we find the explanation of various morbid metabolic changes such as result from microörganismal poisons. The excess or deficiency of normal stimulating bodies also greatly changes the behavior of the cells. The greater number of cellular functions are carried on by enzymes, and it is fascinating to observe the analytic and synthetic activity of these bodies. Perhaps no better illustration can be offered that what goes on in the life history of the potato. In the green leaves of the plant, through the action of sunshine and chlorophyl, starch is manufactured in large quantities, granules being visible in microscopic sections of the leaves. The starch store-house is, however, the tuber under ground. But starch is insoluble and hence not transportable. An enzyme in the cells of the leaves therefore acts upon the starch, converting it to soluble sugar, in which form it follows the sap of the plant to the root, where it meets the same enzyme, and is transformed again to starch. When the tuber begins to grow, the starch is again transformed to sugar, dissolves in the sap, flows up the stalk of the young plant, supplying it with nourishment until its own starch-producing function is established. If we contemplate the transformations of the fats in our own bodies again, we will see much the same general plan carried out. The absorbed fats are worked over in one way or another until they are ready for deposition in the fat-storing tissues, which they reach, not as fats, but as molecular groups that can be synthesized to form fats. Thus transformed they remain until the hour of need, when through the activity of

lipase they are again broken up and liberated in soluble form, to be transported to those cells whose needs they may supply.

The analyses that go on in the alimentary canal are but primary changes, and so long as we follow the nourishment throughout the body, just so long do we find similar processes on a smaller scale carried on by the cells, with alternating analysis and synthesis according to the particular kind of cell and its particular function. There can be no doubt that the cells have selective powers, are in some manner adapted for combination with those particular molecular groups fitted to their purposes, and are able to seize upon and combine with them. There is probably no better method of representing this than by Ehrlich's conception of haptophores and receptors. He conceives each cell to consist of the nucleus or executive center, and the cytoplasm by which the nutrition and other functions are maintained. Such molecular groups as are needed for the cellular purposes are caught from the surrounding pabulum and held by means of molecular cellular groups especially adapted to them. His graphic representation is thus shown:

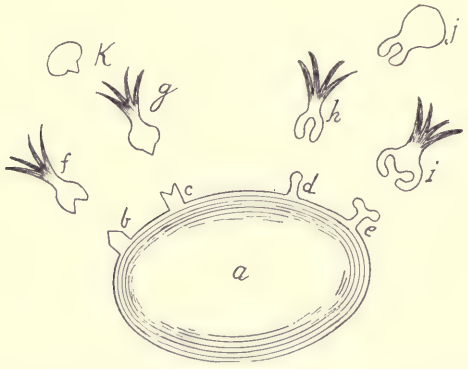

FIG. 1.—Cell with receptors of the first order adapted for union with haptophorous molecular groups of various kinds, by which just those simple groups immediately utilizable by the cell are fixed and retained until they can be subjected to the necessary analytic or synthetic changes. *a*, the cell; *b*, *c*, *d*, *e*, various receptors adapted to haptophores *f*, *g*, *h*, *i*; *j*, *k*, haptophores connected with abnormal molecular groups, as well adapted for combination with the cell as those normally received by it, but not answering the same purposes.

Each cell is provided with enough receptors to enable it to carry into its substance as much combined substance as may be needed for its own purposes. Such simple adaptations as are shown in Fig. 1 belong to receptors of the first order. All of the cellular requirements may not, however, be thus directly supplied, and it may be necessary for the cell to be provided with means for bringing together two substances by whose combined effects its needs may be supplied. Thus:

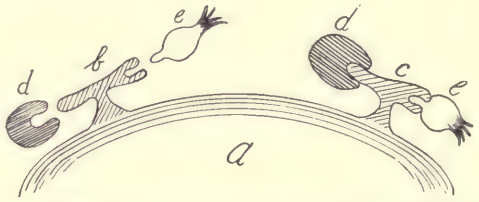

FIG. 2.—Cell with receptors of the second order, not fixing immediately utilizable molecular groups, but groups that must be acted upon by some zymogen before becoming appropriate for the cellular requirements. *a*, the cell; *b* and *c*, receptors; *d*, molecule with adapted haptophore group; *e*, zymogen molecule with adapted haptophore; *c*, *d*, *e*, complete union of zymogen, molecule to be transformed, and receptor by which the transformation products are absorbed by the cell.

We have cell receptors of the second order (Fig. 2, *a*) by which nutriment and zymogenic substances can be brought together so that the action of the zymogen may enable the cell to utilize molecular compounds which it could not otherwise analyze. The cells may appropriate many useful molecular combinations directly by receptors of the first order, but in all probability a greater number are treated by receptors of the second order, and it is only after some zymogen has partly disrupted the molecule caught that the cell can appropriate the particular combinations needed. The disrupted molecule, now transformed by the loss of groups of atoms, being of no further use to the cell, is liberated, to be caught by the receptors of other cells, and further disrupted or synthesized into new combinations for further use, or for elimination as a waste product.

It is inconceivable that the nutritional

requirements of all of the cells are identical. The gastric cells engaged in secreting hydrochloric acid cannot be imagined to elaborate that mineral substance out of the same materials by which their own substance is reintegrated, or out of which other cells manufacture the digestive enzymes, or precipitate the salts of lime and magnesium to form bone. Each cell must be endowed by nature with special means for securing the materials for the performance of its own function, as well as for maintaining its own integrity of substance.

Among the free and independent cellular creatures the impulses by which life is maintained are external to the cells which respond automatically to various stimuli. Recall the behavior of the ameba. Other things being equal, the presence of particles adapted to its use is sufficient guarantee that they will be consumed, and even useless particles may be taken up if they accidentally have closely similar chemotactic properties. The same is true of the semi-independent cells of the higher animals, as shown by the behavior of the leucocytes toward bacteria, of which, other things being equal, a definite number will be broken up. But the cells of the higher animals are subjected to certain influences made necessary by their specialization, not felt by the free and independent cells. Thus, the equilibrium of the ameba can be regarded as stable, and its metabolic requirements uniform; but in the metazoa, and especially the higher animals, when the structural differentiations result in the colonization of the cells in widely separated organs, it becomes necessary that the general equilibrium be maintained by some means of communication through which groups of cells can be thrown into action by stimuli applied at the appropriate moment. This is largely accomplished through the nervous system, concerning whose functions we cannot interest ourselves here, but it is also accomplished through other and more subtile means.

Thus, great numbers of cells may be stimulated to activity or thrown into a state of rest by the appearance of certain substances, the nature of which is unknown, in the blood. This is illustrated by experiments performed upon well-fed and starved dogs. If the blood of a well-fed dog is transfused through the vessels of a starved dog, the urea it contains is diminished by elimination, but if the blood of the starved dog is transfused through the vessels of the well-fed dog its urea content greatly increases because the cells of the well-fed dog are stimulated to metabolic activity. This seems to prove that something is present in the blood of the starved dog that excites the cells to activity, or something in the blood of the well-fed dog that inhibits their activity. If the inhibition of cellular nutrition depends upon the depressing action of the accumulated waste products of the well-fed cells in the blood of the well-fed dog, it shows that in addition to the nervous mechanism there are other factors that operate to excite or depress the cellular activities. The secreted products of the pituitary, of the thyroid, of the sexual glands, exert influences upon cellular nutrition that are too well known to require more than passing mention. The fact that animals abort if the corpus luteum of pregnancy is destroyed indicates some important though occult influence upon the nutrition of the embryo by the secretion of this epithelial structure so like a gland.

I am told that Halliburton recently succeeded in causing the development of the mammary glands of a virgin animal by injecting it with the pulverized dried embryo of another animal. Thus it may be that the mysterious development of the mammary glands in early pregnancy depends upon some metabolic product of the embryo circulating

through the blood of the mother and exciting the mammary cells to proliferation.

It is not easy to come to a clear conception of those processes of cell life called metabolic because they are so inseparably associated with the other functions of the cells. To use a quotation from Huxley, of which I am very fond, "All living matter undergoes universal waste by oxidation, and a concomitant reintegration by the intussusception of new matter." That is the essence of metabolism—the wear and tear by oxidation and the concomitant reintegration. The encysted cell in the resting condition undergoes no wear and tear and needs no reintegration, so that encysted unicellular organisms may remain unchanged for years. A few days ago in my laboratory we opened a bottle containing some earth in which Kitasato had found very numerous bacilli of malignant edema. He had placed a large bottle of it in the laboratory in Berlin in 1888 or 1889, and in 1895 some of it was given to me by Dr. Sobernheim in Halle. It had been untouched all these years, but from the spores it contained we were still able to grow cultures of the organism. In such periods of rest the metabolic functions are almost extinguished, but so soon as the spores were planted in appropriate media everything became changed. The spores developed into bacteria which multiplied in great numbers, produced chemical changes in the culture media with the evolution of considerable gas and a change of the reaction to distinct acidity.

Many cells of the perfected human body, having finished their legitimate work, probably rest throughout the remainder of the individual's life, or are only occasionally aroused to activity when some accidental circumstance obtains.

We know so little of cell life that we do not know even approximately the duration of life of any cell in the body. I fancy most of us believe them to be constantly dying and constantly replaced by new cells of their own kind, but the extreme rarity of karyokinetic changes in the tissues of healthy adult animals and the difficulty with which certain cells, as those of the muscles, are reformed after injury, makes it quite probable that many of our cells are as old as we are, and will live as long as we do.

The cell that performs active function of any kind not only reintegrates its substance, but also transforms the molecular composition of those compounds from which it splits off the molecular combinations fitted to its uses. The changes are also included in the metabolic phenomena, and indeed it seems as though this kind of metabolic transformation greatly exceeded in importance, both qualitatively and quantitatively, those of cell reintegration.

So long as the cells are supplied with their proper nourishment, so long as they harmoniously interact upon one another, and so long as their waste products are synthesized to appropriate compounds for excretion, a definite equilibrium is maintained, and health obtains, but so soon as any one of these functions becomes disturbed, disease results.

The means by which the equilibrium may be disturbed are so multifarious that little more can be done than mention them. Thus, the diet may be inappropriate in that it contains too much substance approximating the waste products of the cells themselves to be properly handled by the cells. This seems to be true in cases in which it contains an excess of nucleoalbumins, from which excessive quantities of the purin bases are manufactured. The products of the molecular transformations of these bodies, some of which are poisonous, then accumulate to the disadvantage of the whole organism. There may be an excessive absorption of untransformed food products, or of partially transformed

products, so that new and ill-adapted compounds are brought to the cells. Substances entirely foreign to the body may appear as the result of the metabolic activity of parasitic cells, whose affinities for combination with the cell receptors may cause them to exclude the normal and useful molecules. Combinations may form as usual, but in the absence of the necessary activating substances—zymogenic haptophores—remain unabsorbed by the cells. The failure of the essential stimulating substances may be followed by general or local decline of the cell activity, or the presence—as in fever—of abnormal stimulating substances may excite the cells to excessive activity or waste. And the analyzed compounds from which the cells have abstracted their necessary molecules failing of synthesis to the inert compounds suitable for elimination, these may accumulate and poison the cells.

Metabolism, complex as it may seem from this little that we do know about it, is infinitely more complex in what we do not know about it. Studies of the metabolic functions that have to do only with the aggregate results obtaining in disease, while useful, are apt to be misdirected in that they show only what is happening, not why it happens, so that the therapeutic management of any morbid state, if based upon them, may be far from reaching the true metabolic error.

EROTIC SYMBOLISM.*

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The most frequent type of erotic symbolism is that which idealizes the foot and the shoe. This phenomenon is frequently complex and raises many questions of interest. Theologically, the lubricious conception of the shoe early appears prominently in church sumptuary laws. At the Rheims synod of 972 Abbot Raoul of St. Remi denounced monks for wearing indecent shoes of large size and tissue so transparent that nothing was hidden. From this time on these "chicken shoes" with a claw or beak, although pursued by anathemas of popes and invectives of preachers, continued in use for more than four centuries. They were considered by middle-aged casuists as most abominable evidences of lubricity. It is not evident at first sight, remarks Dufour,[1] what there could be scandalously suggestive in shoes terminating in a lion's claw, an eagle's beak, or a ship's prow. The excommunication of this species of shoe preceded the pornographic inventions of libertines, who wore shoes with phallic terminations. These were often worn by modest women, who did not recognize what fashion placed at the tips of their shoes. Royal and ecclesiastic sumptuary laws alike forbade these shoes. Great lords and ladies, probably wearing modest "chicken shoes," defied these laws. Charles V. and the Avignon pope Urban V. forbade these shoes, but they still persisted in use in the reign of Louis XI. The phallic termination fashion had meanwhile turned into spirals like those of Chinese and Turkish shoes.

Even for the normal lover the foot is a most attractive part of the body. Stanley Hall[2] found that among the parts specified as most admired in the other sex by young men and women who answered a questionnaire the feet came fourth (after the eyes, hair, stature, and

*Read before the Chicago Academy of Medicine, Nov. 17, 1905.

size). Casanova,[3] an acute student and lover of women, but not a foot-fetishist, remarks that all men who share his interest in women are attracted by their feet. These offer the same interest as the particular edition does to the bibliophile.

The hand does not appear among the parts of the body normally of supreme interest. An interest in the hand is by no means uncommon,[4] but the hand does not have the mystery which envelops the foot, and hand-fetishism, of which Binet[5] and Krafft-Ebing[6] report instances, is rather rare.

The results of a questionnaire as to children's sense of self, to which over 500 replies were received, Stanley Hall[7] thus summarizes with reference to the feet: "A special period of noticing the feet comes somewhat later than that in which the hands are discovered to consciousness. Our records afford nearly twice as many cases for feet as for hands. The former are more remote from the primary psychic focus or position, and are also more often covered, so that the sight of them is a more marked and exceptional event. Some children become greatly excited whenever their feet are exposed. Some infants show signs of fear at the movement of their own knees and feet covered, and still more often fright is the first sensation which signalizes the child's discovery of its feet. . . . Many are described as playing with them as if fascinated by strange, newly-discovered toys. They pick them up and try to throw them away, or out of the cradle, or bring them to the mouth, where all things tend to go. . . . Children often handle their feet, pat and stroke them, offer them toys and the bottle, as if they, too, had an independent hunger to gratify, an ego of their own. . . . Children often develop (later) a special interest in the feet of others, and examine, feel them, etc., sometimes expressing surprise that the pinch of the mother's toe hurts her and not the child, or comparing their own and the feet of others point by point. Curious, too, are the intensifications of foot-consciousness throughout the early years of childhood, whenever children have the exceptional privilege of going barefoot, or have new shoes. The feet are often apostrophized, punished, beaten sometimes to the point of pain for breaking things, throwing the child down, etc. Several children have habits, which reach great intensity and then vanish, of touching or tickling the feet, with gales of laughter, and a few are described as showing an almost morbid reluctance to wear anything upon the feet, or even to having them touched by others. . . . Several almost fell in love with the great toe or the little one, especially admiring some crease or dimple in it, dressing it in some rag of silk or bit of ribbon, or cut-off glove fingers, winding it with a string, prolonging it by tying on bits of wood. Stroking the feet of others, especially if they are shapely, often becomes almost a passion with young children, and several adults confess a survival of the same impulse which it is an exquisite pleasure to gratify. The interest of some mothers in babies' toes, the expressions of which are ecstatic and almost incredible, is a factor of great importance." "There is in childhood," he remarks,[8] "a form of courtship consisting solely in touching feet under the desk." Animals seem to have a certain sexual consciousness in the feet; I have noticed a male donkey, just before coitus, bite the feet of his partner.

The normal lover in most civilized countries does not usually attach such importance to the foot as he frequently does to the eyes, although the feet play a very conspicuous part in the work of many novelists. Hardy[9] shows an unusual, but by no means predominant, interest in the feet and shoes of his heroines. (See the observations of his cobbler.) Wilkie

Collins[10] makes his shrewd steward Betteredge agree with Cobbett in choosing a wife from the way she sets her foot down. Goethe[11] narrates an episode involving the charm of the foot and the kissing of the beloved's shoe. To a not inconsiderable minority the foot or boot becomes the most attractive part of a woman. In some cases the woman seems comparatively an appendage to her feet or shoes. Shoes under civilized conditions much more frequently constitute the sexual symbol than do the feet, which is not surprising since in every-day life the feet are not often seen. Only under exceptionally favorable circumstances does foot-fetishism occur, as in the case of the West Indian physician reported by Morandon de Monteyel.[12] His mother had been insane. He had obsessions as to micturition incapacity. He suffered from nocturnal urinary incontinence. The West Indian working women who go barefoot often have beautiful feet. Puberty evolved under these conditions, and foot-fetishism began. He particularly admired large, fat, arched feet with delicate skin and large, regular toes. He masturbated with images of feet. At 15 he had relationships with a negro chambermaid, but feared to mention his fetishism, though a touch of her feet chiefly excited him. He gave up masturbation, had a succession of mistresses, but was always ashamed to confess his fancies until, at 33, in Paris, a very intelligent woman, then his mistress, discovered his obsession and skilfully gratified it without shocking his modesty. He was devoted to this mistress, who had very beautiful feet (he had been horrified by the feet of Europeans generally), until she finally left him.

The first case of foot-fetishism recorded in detail is probably that of Restif de la Bretonne (1734-1806), publicist and novelist, one of the most remarkable French literary figures of the later eighteenth century. Restif was neurotic, but not extremely so. His shoe-fetishism, though distinctly pronounced, was not pathologic. The shoe was not itself an adequate gratification of the sexual impulse, but simply a highly important aid to tumescence, a prelude to the natural climax of detumescence; only occasionally and *faute de mieux* in absence of the beloved person was the shoe an adjunct to masturbation. In Restif's stories and elsewhere the attraction of the shoe is constantly discussed as a motive. Such passages are founded on his personal experiences. In his elaborate autobiography[13] he has frankly set forth the gradual evolution of his idiosyncrasy. The first remembered trace dated from the age of four, when he was able to recall having remarked the feet of a young girl in his native place. Restif, a sexually precocious youth, had at the age of nine, though delicate and shy, his thoughts absorbed in the girls around him.

"While little Monsieur Nicolas," he tells us, "passed for a Narcissus, his thoughts as soon as he was alone, by night or by day, had no other object than that sex he seemed to flee from. The girls most careful of their persons naturally pleased him most, and as the part least easy to keep clean is that which touches the earth, it was to the foot-gear that he mechanically gave his chief attention. Agathe, Renie, and especially Madeline were the most elegant of the girls at that time; their carefully selected and kept shoes, instead of laces or buckles, which were not yet worn at Sacy, had blue or rose ribbons according to the color of the skirt. I thought of these girls with emotion; I desired—I knew not what; but I desired something, if it were only to subdue them."

The origin Restif here assigns to his foot-fetishism may seem paradoxic; he admired the girls who were most clean and neat in their

dress, and therefore paid most attention to their clothing where least clean and neat. But, however paradoxic the remark may seem, it is psychologically sound. All fetishism is a kind of obsession not necessarily morbid. As the careful work of Janet and others has shown, an obsession is a fascinated attraction to some object or idea which gives the subject an emotional shock by its contrast to habitual moods or ideas. The ordinary morbid obsession is not usually harmoniously coördinated with the experiences of the subject's daily life, and shows, therefore, no tendency to become pleasurable. Sexual fetishisms, on the other hand, have a reservior of agreeable emotions to draw on and are thus able to acquire stability and harmony. No element of masochism is involved in Restif's fetishism, though the mistake is frequently made of regarding these two manifestations as usually or even necessarily allied. Restif wishes to subject the girl who attracts him; he has no wish to be subjected by her. He was especially dazzled by a young girl from another town whose shoes were of a fashionable cut with buckles, "and who was a charming person besides." She was delicate as a fairy and rendered his thoughts unfaithful to the robust beauties of his native Sacy. "No doubt, being frail and weak myself, it seemed to me that it would be easier to subdue her. This taste for the beauty of the feet was so powerful in me that it unfailingly aroused desire and would have made me overlook ugliness. It is excessive in all those who have it." He admired the foot as well as the shoes: "the factitious taste for the shoe is only a reflection of that for a pretty foot." "When I entered a house and saw the boots arranged in a row, as is the custom, I would tremble with pleasure; I blushed and lowered my eyes as if in the presence of the girls themselves. With this vivacity of feeling and a voluptuousness of ideas inconceivable at the age of ten I still fled, with an involuntary impulse of modesty, from the girls I adored."

It is clearly evident this combination of sensitive, precocious sexual ardor with extreme shyness was the soil on which the germ of foot-fetishism gained firm root, and persisted in some degree throughout a long life largely given up to a pursuit of women, abnormal rather by excess than perversity. A few years later, chancing to see a pretty pair of shoes in a boot-maker's shop, and then hearing that they belonged to a girl whom he then reverently adored at a distance, he blushed and nearly fainted.

In 1749, for a time attracted to a young woman much older than himself, he secretly carried away one of her slippers and kept it for a day; a little later he again took away a shoe of hers which had fascinated him when on her foot, and seems to have used it to masturbate.

Perhaps the chief passion of Restif's life was his love for Colette Parangon. He was still a boy (1752). She was the young, virtuous wife of the printer whose apprentice Restif was, and in whose house he lived. Madame Parangon, a charming woman, was not happily married, and evidently felt a tender affection for the boy whose excessive love and reverence for her were not always successfully concealed.

"Madame Parangon possessed a charm which I could never resist, a pretty little foot; it is a charm which arouses more than tenderness. Her shoes, made in Paris, had that voluptuous elegance which seems to communicate soul and life. Sometimes Colette wore shoes of simple white drugget or with silver flowers; sometimes rose-colored slippers with green heels, or green with rose heels; her supple feet, far from deforming her shoes, increased their grace and rendered the form

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more exciting." One day on entering the house he saw Madame Parangon elegantly dressed and wearing rose-colored shoes with tongues and with green heels and a pretty rosette. They were new, and she took them off to put on green slippers with rose heels and borders, which he thought equally exciting. "As soon as she had left the room," he continues, "carried away by the most impetuous passion and idolizing Colette, I seemed to see her and touch her in handling what she had just worn; my lips pressed one of these jewels, while the other, deceiving the sacred end of nature, from excess of exaltation replaced the object of sēx (I cannot express myself more clearly). The warmth which she had communicated to the insensible object which had touched her still remained and gave a soul to it; a voluptuous cloud covered my eyes." He would kiss with rage and transport whatever had come in close contact with the woman he adored, and on one occasion eagerly pressed his lips to her cast-off underlinen, *e la secretiora penetralium.*

At this period Restif's foot-fetishism, reaching its highest development, was the aberration of a highly sensitive precocious boy. While preoccupation with feet and shoes persisted throughout life, it never became a complete perversion and never replaced the normal aim of sexual desire. His love for Madame Parangon, one of the deepest emotions in his whole life, was likewise the climax of his shoe-fetishism. She represented his ideal woman, an ethereal sylph, with wasp-waist and a child's feet. His highest praise for a woman was that she resembled Madame Parangon. He desired that her slipper should be buried with him.[14]

Shoe-fetishism, more especially if there be included under this term all real or pseudo-masochism in which attraction to shoes or slippers is the chief feature, is a not infrequent phenomenon, certainly the most frequent form of fetishism. Krafft-Ebing narrates many cases. Every experienced harlot has known men who merely desire to gaze at her shoes, or possibly to lick them, and are quite willing to pay for this privilege. In London such a person is known as a "boot-man," in Berlin as a "Stiefelfresser."

Predominance of the foot as a focus of sexual attraction, while to-day not uncommon, is still sufficiently frequent to be called normal. The majority of ardent lovers do not markedly experience its attraction. But foot-fetishism, which to-day is abnormal, even when not so extreme as to be morbid, becomes more intelligible when it is realized that in earlier periods, and even to-day in some regions, the foot is such a focus of sexual attraction that in some degree foot-fetishism becomes normal.

The most pronounced, best known example of normal foot-fetishism occurs to-day among the Southern Chinese. To a Chinese husband his wife's foot is more interesting than her face. A Chinese woman is as shy of showing her feet to a man as a European woman her breasts. They are reserved for her husband's eyes alone. To look at a woman's feet in the street is highly indelicate. Chinese foot-fetishism is connected with the custom of foot-compression. This custom appears to rest on the fact that Chinese women naturally have a very small foot. Compression is therefore an example of wide-spread tendency to accentuate, even by deformation, racial characteristics in search for beauty. But there is more than this. Beauty is a name for sexual attractiveness. The energy expended to make the Chinese woman's small foot still smaller measures the sexual fascination which it exerts. The practice arose on the basis of foot sexual attractiveness, though it has doubtless served to heighten that attractiveness just as the small waist (according to Stratz), a char-

acteristic beauty of the European woman, becomes to the average male European still more attractive when accentuated even to deformity by the corset.

Referring to the pedal sexual fascination in China, J. Matignon[15] writes: "My attention has been drawn to this point by a large number of pornographic engravings, of which the Chinese are very fond. In all these lascivious scenes the male voluptuously fondles the woman's foot. When a Celestial takes into his hand a woman's foot, especially if it be very small, the effect upon him is the same as provoked in a European by the palpation of a young, firm bosom. All the Celestials interrogated on this point have replied unanimously: 'Oh, a little foot! You Europeans cannot understand how exquisite, how sweet, how exciting it is!' Contact of the genital organ with the little foot produces in the male an indescribably deep voluptuous feeling. Women skilled in love know that to arouse the ardor of their lovers a better method than all Chinese aphrodisiacs—including ginseng and swallows' nests—is to take the penis between their feet. Not rarely do Chinese Christians accuse themselves at confession of having had 'evil thoughts on looking at a woman's foot.'"

A congenitally club-footed Chinese Empress, noted for her vice, is said about 1100 B. C. to have desired women to resemble her. The practice of compressing the foot, it is claimed, thus arose. This is only tradition, since in 300 B. C. Chinese books were destroyed.[16] This practice is charged also to the wish to keep women indoors. But women are not secluded in China, nor does foot-compression usually render a woman unable to walk. Many intelligent Chinese are of opinion that its object is to promote the genital and thigh development, and so to aid both intercourse and parturition. No evidence exists for such a belief, though Morache[16] found that the mons veneris and labia are largely developed in Chinese women, and not in Tartar women living in Pekin (who do not compress the foot). If any correlation exist between the feet and the pelvic regions it is more probably congenital than due to artificial compression of the feet. The ancients seem to have believed that a small foot indicated a small vagina. Restif de la Bretonne, who had ample opportunities for forming an opinion on a matter in which he took so great an interest, believed that a small foot, round and short, indicated a large vagina. Even if a real correlation exist between foot and vagina, that by no means suffices to render the foot a focus of sexual attraction.

The most logical view is that the foot bandage is strictly analogous to the waist bandage or corset, which likewise tends to produce deformity of the constricted region. Stratz[17] ingeniously remarks that the success of Chinese in dwarfing trees may have suggested a similar attempt in regard to women's feet. In any case both dwarfed trees and bound feet bear witness to the same love in the Mongolian for small and elegant, not to say deformed, things. For a Chinaman the deformed foot is a "golden water-lily." Ploss[18] cites many facts (with illustrations) bearing on Chinese foot deformation.

The significance of the sexual emotion aroused by the female foot in China and the origin of its compression become clear when it is realized that such foot-fetishism is an extreme development of a tendency fairly well marked among nearly all yellow races. Jacoby,[19] who has brought together a number of interesting facts bearing on the sexual significance of the foot, states that a similar tendency exists among the Mongol and Turk Siberians and in east and central European Russia, among the Permiaks, Wotiaks, etc. Here the woman, at all events when young,

has always her feet, as well as her head, covered, however little clothing she may otherwise wear.

"On hot nights or on baking days you may see these women with uncovered breasts, or even entirely naked, without embarrassment, but you will never see them with bare feet, and no male relations, except the husband, will ever see the feet and lower part of the legs of the women in the house. These women have their modesty in their feet, and also their coquetry; to unbind the feet of a woman is for a man a voluptuous act. The touch of the bands produces the same effect as a corset still warm from a woman's body on a European man. A woman's beauty, that which attracts and excites a man, lies in her foot; in Mordvin love poems celebrating the beauty of women there is much about her attire, especially her embroidered chemise, but as to personal charms the poet is content to state that 'her feet are beautiful;' with that all is said. The young peasant woman of the central provinces as part of her holiday raiment puts on great woolen stockings which come up to the groin and are then folded over to below the knee. To uncover the feet of a person of the opposite sex is a sexual act, and has thus become the symbol of sexual possession, so that the stocking or foot-gear became the emblem of marriage, as later the ring. It was so among the Jews.[20] St. Vladimir the Great asked in marriage the Prince Rogvold's daughter. As Vladimir's mother had been a serf the princess proudly replied that she 'would not uncover *the feet of a slave.*' In Eastern Russia when a young girl to-day tries to find out by divination whom she will have as a husband the traditional formula is 'Come, take my stockings off.' Among the populations of the north and east the bride sometimes must do this for her husband on the wedding night, and sometimes the bridegroom for his wife, not as a token of love but as a nuptial ceremony. Among the Russian professional classes and small nobility parents place money in the stocking of their child at marriage as a present for the other partner, it being supposed that the couple mutually remove each other's foot raiment, as an act of sexual possession, the emblem of coitus." The practice of children to-day hanging up stockings at night for presents seems a survival of the last mentioned custom.

While the foot sexual symbolism, with or without associated foot-fetishism, is most highly developed in Asia and Eastern Europe, it has, as already shown, not been altogether unknown in stages of western civilization. Traces are even yet found here and there. Schintz[21] refers to the connection between the feet and sexual pleasure not only among Egyptians and Arabs, but among ancient Germans and modern Spaniards; likewise Jacoby* points out that the Greeks, Romans, and especially the Etruscans, usually represented chaste, virgin goddesses with their feet covered, even though they might be otherwise nude. Ovid is never weary of dwelling on the sexual charm of the feminine foot. He represents the chaste matron as wearing a weighted stola which always fell so as to cover her feet. Only the courtesan, or nymph taking part in an erotic festival, appears with raised robes revealing the feet.† So grave a historian as Strabo, as well as Ælian, refers to the story of the courtesan Rhodope whose sandal was carried off by an eagle, dropped in the King of Egypt's lap as he was administering justice, so that he could not rest until he had discov-

*Mirabeau[23] pointed out that modern Greek women sometimes use their feet to provoke orgasm in their lovers. Simultaneous mutual masturbation by means of the feet is not unknown to-day. An English shoe-fetishist states that he at one time was accustomed to practice this with a married lady (Brazilian)—she with slippers and he without—who derived gratification equal to his own.

†Jacoby gives a large number of references to Ovid's works bearing on this point. "In reading him," he remarks, "one is inclined to say that the psychology of the Romans was closely allied to that of the Chinese."

ered to whom this delicately small sandal belonged, and finally made her his queen. Kleinpaul,[22] who records this story, has collected many European sayings and customs (including Turkish) indicating that the slipper is an ancient symbol of the female genitals.*

Spain, ever tenacious of ancient ideas, preserved longer than other countries ancient classic traditions about the foot as a focus of modesty and object of sexual attraction. In Spanish religious pictures the Virgin's feet must always be covered, the clergy ordaining that her robe should be long and flowing so that the feet might be covered with decent folds.

Pacheco,[24] the master and father-in-law of Velasquez, writes: "What can be more foreign from the respect which we owe to the purity of Our Lady the Virgin than to paint her sitting down with one of her knees placed over the other, and often with her sacred feet uncovered and naked? Let thanks be given to the Holy Inquisition which commands that this liberty should be corrected!" Pacheco's duty in Seville was to see that these commands were obeyed.

At the court of Philip IV., at this time, that the princesses never showed their feet is evident from the pictures of Velasquez. When a local manufacturer desired to present that monarch's second bride, Mariana of Austria, with some silk stockings the offer was indignantly rejected by the Court Chamberlain: "The Queen of Spain has no legs!" As Spanish influence was then considerable, the fashion of Spain spread to other countries. In Vandyck's pictures of English beauties the feet are not visible, though the more characteristically English painters somewhat later display them conspicuously. The French custom in this matter is at the farthest remove from the Spanish. At the present day a well-bred Spanish woman shows as little as possible of her feet in walking. Even in some most characteristic Spanish dances there is little or no kicking, and the feet may be invisible throughout. It is noteworthy that in numerous figures of Spanish women (probably artists' models) reproduced in Ploss's Das Weib stockings are worn, although the women are generally otherwise quite naked. Max Dessoir[26] states that it is of interest in this connection to recall that silk stockings, if not of Spanish origin, were certainly peculiarly associated with Spain, and in the sixteenth century Spanish silk stockings were a luxury not often to be indulged in even by kings and queens. Henry VIII. only wore them on very special occasions. Max Dessoir finds that in Spanish pornographic photographs women always have their shoes on, and he considers this an indication of perversity. According to Gautier[27] a Spanish prostitute uncovers her foot to indicate assent.

The tendency, thus found normal at earlier periods of civilization, to insist on sexual symbolism of the feminine foot or its coverings and to regard them as a special sexual fascination is not without significance in interpretation of sporadic modern manifestations of foot-fetishism. Eccentric as foot-fetishism may appear, it is simply the reëmergence, by a pseudo-atavism or arrest of development, of a mental or emotional impulse which ancestors probably experienced, and often traceable among young children to-day.* The occasional reappearance of this bygone impulse and the stability which it may acquire are thus conditioned by the sensitive reaction of an abnormally nervous, usually precocious, organism to influences which among the average and

*Bloch[25] brings together many interesting references bearing on the ancient sexual and religious symbolism of the shoe.

*Jacoby (*loc. cit.*, p. 797) appears to regard shoe-fetishism as a true atavism. "The sexual adoration of feminine foot-gear," he concludes, "perhaps the most enigmatic and certainly the most singular of degenerative insanities, is thus merely a form of atavism, the return of the degenerate to the very ancient and primitive psychology which we no longer understand and are no longer capable of feeling."

ordinary population of Europe to-day are either never felt, or quickly outgrown, or very strictly subordinated in the highly complex crystallizations which the course of love and the process of tumescence create.

This is not alone true of foot-fetishism only. In some other fetishisms seemingly congenital predisposition is even more marked. This is not only the case as regards hair-fetishism, fur-fetishism (see Krafft-Ebing[28]). In fetishisms of all kinds not only is there often no record of commencement in a definite episode (whose absence might be due to the original incident having been forgotten), but in some cases the fetishism seems developed very slowly.

In this sense, although hazardous to speak of foot-fetishism as an atavism, it may clearly arise on a congenital basis. It represents the rare development of an inborn germ, usually latent among moderns, which in earlier civilization frequently reached a normal, general fruition.

This congenital element of erotic symbolism is of especial interest because more than any sexual perversions the fetishisms are most vaguely conditioned by inborn states of the organism and most definitely aroused by seemingly accidental associations or shocks in early life. Inversion is sometimes so fundamentally ingrained in the individual's constitution that it arises and develops despite the strongest influence in a contrary direction. But a fetishism, while it tends to occur in sensitive, nervous, timid, precocious individuals—that is to say, individuals of more or less neuropathic heredity—can usually, though not always, be traced to a definite starting-point in the shock of some sexually emotional episode in early life.

A few examples of the influence of such association may here be given, involving various erotic symbolisms. Magnan[29] has recorded the case of a hair-fetishist, living in a district where the women wore their hair done up, who at the age of 15 experienced pleasurable feelings with erection at the sight of a village beauty combing her hair; from that time flowing hair became his fetish, and he could not resist the temptation to touch it and if possible sever it, thus becoming a hair-despoiler, for which he was arrested but not sentenced.

I have elsewhere recorded[30] the history of a boy of 14, having already had imperfect connection with a grown-up woman, who associated much with a young married lady; he had no sexual relations with this woman, but one day she urinated in his presence, and he saw that her mons veneris was covered by very thick hair; from that time he worshiped this woman in secret and acquired a lifelong fetishistic attraction to women whose pubic hair was similarly abundant. Roubaud[28] reported the case of a general's son, sexually initiated at 14 by a 21-year-old blonde, who to avoid detection always retained her clothing—gaiters, a corset, and a silk dress. When the boy's studies were completed, and he was sent to a garrison where he could enjoy freedom, he found that the sexual appetite was aroused only by blonde women dressed like the lady who had first excited sexual desire. He gave up all thoughts of matrimony, as a woman in nightclothes produced impotence.[31] Krafft-Ebing[32] records the somewhat similar case of a nervous Polish boy of old family seduced at 17 by a French governess, who during several months practiced mutual masturbation with him; in this way his attention became attracted by her very elegant boots, and in the end he became a confirmed boot-fetishist. Hammond[33] reports a boy of seven, of bad heredity, taught to masturbate by a servant-girl; on one occasion she practiced this on him with her foot without taking off her shoe; it was the first time the maneuver gave him any pleasure. An association thus established led to

extreme shoe-fetishism. Moraglia[34] records the case of a government official who copulated first on a staircase; the creak of his partner's shoes against the stairs, produced by her efforts to accelerate orgasm, created association developing into an auditory shoe-fetishism. In the streets he was compelled to follow ladies whose shoes creaked, ejaculation being thus produced. To obtain complete satisfaction he made a prostitute, shod but otherwise naked, sit in front of him moving her feet so that the shoes creaked.

Bechterew[35] in St. Petersburg has recorded the case of a man who when a child used to fall asleep at the knees of his nurse with his head buried in the folds of her apron; in this position he first experienced erection and voluptuous sensations; when a youth he had no attraction to naked women, but in real life and in dreams was sexually excited only under conditions of his early experience. In relations with women he preferred them dressed, and was excited by the rustling sound of their skirts. There was no traceable neuropathic taint or other personal peculiarity.

In a case detailed by Moll,[36] a philologist of sensitive temperament, but sound heredity, had always been fond of flowers. At 21 he became engaged to a young lady who wore large roses fastened in her jacket; from this time roses became to him a sexual fetish; to kiss them caused erection. His erotic dreams were accompanied by rose visions and rose-odor hallucination. The engagement was finally broken off, and the rose-fetishism disappeared.

Such associations may occur in the early experiences of even the most normal persons. The degree to which they influence the subsequent life, thought, and feeling depends on morbid emotional receptivity, on the extent of hereditary susceptibility to abnormal deviation. Precocity undoubtedly favors such deviation; a child precociously and abnormally sensitive to persons of the opposite sex, who before puberty has established the normal channels of sexual desire, is peculiarly liable to become the prey of a chance symbolism. All degrees of such symbolism are possible. While the average insensitive person may fail to perceive them at all, for the more alert and imaginative lover they are a fascinating part of the highly charged crystallization of passion. A more nervously exceptional person, once such a symbolism has become firmly implanted, may find it absolutely essential to the charm of a beloved, charming person. Finally, for the individual who is thoroughly unsound the symbol becomes generalized; a person is no longer desired at all, being merely regarded as an appendage of the symbol, or being dispensed with altogether; the symbol is alone desired, and is fully adequate to impart by itself complete sexual gratification. While it must be considered a morbid state to demand a symbol as an almost essential part of the charm of a desired person, it is only in the final condition, in which the symbol is all-sufficing, that true, complete perversion occurs. In the less complete forms of symbolism it is still the woman who is desired, and the ends of procreation may be served; when the woman is ignored and the mere symbol is an adequate and even preferred stimulus to detumescence, the pathological condition becomes complete.

Krafft-Ebing regarded shoe-fetishism as a more or less latent form of masochism, the foot or the shoe being the symbol of the subjection and humiliation which the masochist feels in the presence of the beloved object. Moll is also inclined to accept such a connection.

"The very numerous class of boot-and-shoe-fetishists forms the transition to the manifestations of another independent perversion—*i.e.*, fetishism itself; but it stands in closer relationship to the former. . . . It is highly probable, and shown by a correct classification of the observed cases, that the majority—and

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perhaps all—of the cases of shoe-fetishism rest upon a basis of more or less conscious masochistic desire for self-humiliation. . . .The majority or all may be looked upon as instances of latent masochism (the motive remaining unconscious), in which the *female foot or shoe, as the masochist's fetish,* has acquired an independent significance."

"Though Krafft-Ebing may not have cleared up the whole matter," Moll[33] remarks, "I regard his deductions concerning the connection of foot-and-shoe-fetishism to masochism as the most important progress that has been made in the theoretic study of sexual perversions. . . . In any case the connection is very frequent."

It is quite easy to see that this supposed connection of masochism and foot-fetishism forms a seductive theory. It is also undoubtedly true that a masochist may very easily be inclined to find in his mistress's foot an aid to the ecstatic self-abnegation which he desires to attain.* But only confusion is attained by any general attempt to amalgamate masochism and foot-fetishism. In the broad sense in which erotic symbolism is here understood both masochism and foot-fetishism may be coördinated as symbolisms; for the masochist his self-humiliating impulses are the symbol of ecstatic adoration; for the foot-fetishist his mistress's foot or shoe is the concentrated symbol of all that is most beautiful and elegant and feminine in her personality. But if in this sense they are coördinated they remain entirely distinct, and have not even any necessary tendency to become merged. Masochism merely simulates foot-fetishism; for the masochist the boot is not strictly a symbol, it is only an instrument which enables him to carry out his impulse; the true sexual symbol for him is not the boot, but the emotion of self-subjection. For the foot-fetishist, on the other hand, the foot or the shoe is not a mere instrument but a true symbol, the focus of his worship, an idealized object which he is content to contemplate or reverently touch. He himself has no impulse to any self-degrading action, nor the slightest emotion of subjection. In the very typical foot-fetishism presented by Restif de la Bretonne he repeatedly speaks of "subjecting" the woman for whom he feels this fetishistic adoration, and mentions that even when still a child he especially admired a delicate and fairy-like girl in this respect because she seemed to him easier to subjugate; throughout life Restif's attitude toward women was active and masculine, without the slightest trace of masochism.*

To suppose that a fetishistic admiration of his mistress's foot is due to a lover's latent desire to be kicked is as unreasonable as it would be to suppose that a fetishistic admiration for her hand indicated a latent desire to have his ears boxed. In determining whether we are concerned with a case of foot-fetishism or of masochism we must take into consideration the whole of the subject's mental and emotional attitude. An act, however definite, will not suffice as a criterion, for the same act in different persons may have altogether different implications. To amalgamate the two is the result of inadequate psychological analysis and only leads to confusion.

It is, however, often very difficult to decide whether we are dealing with a case which is predominantly one of masochism or of foot-fetishism. The nature of the action desired, as we have seen, will not suffice to determine the psychological character of the perversion. Krafft-Ebing believed that the desire to be

*Moll has reported in detail a case which he and Krafft-Ebing regard as illustrative of the connection between foot-fetishism and masochism. It is essentially a masochism, manifesting itself almost exclusively in the desire to perform humiliating acts in connection with the attractive person's boots.

*Krafft-Ebing[29] goes as far as to assert that "when in cases of shoe-fetishism the female shoe appears alone as the excitant of sexual desire one is justified in presuming that masochistic motives have remained latent. . . . Latent masochism may always be assumed as the unconscious motive." In this way he hopelessly misinterprets some of his own cases.

trodden on, very frequently experienced by masochists, is absolutely symptomatic of masochism.*

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(To be continued.)

MEDICOLEGAL ASPECTS OF DYING DECLARATIONS.[1]

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The psychology of accusations has received too little attention from medical jurists despite its decided interest and marked importance. Hysterical accusations have, however, so forced themselves on medical attention that *Punch* speaks of "Living hysterical scandals down," as a necessary phase of medical life. Hysterical accusations are, however, not the only dangers from false accusations. Confessions, as Wharton and Stille[2] point out, are so often due to mental perturbation as not to be accepted without question.

Within the last thirty years, remarks John Paget,[3] the English courts at Westminster were for many days occupied in the investigation of a charge of a most serious nature, brought against a physician by the husband of one of his patients. The lady kept a journal, in which she noted down with the utmost minuteness the rise, progress, and entire history of an overwhelming passionate attachment between herself and the doctor. This journal came to the husband's hands. The explosion may be imagined. The husband very naturally instituted divorce proceedings. When the trial came on, the journal consisting of three bulky volumes and extending over a period of five years, was produced. Nothing could be clearer, more explicit, or more astounding than the disclosures it contained. But there was not a particle of confirmatory evidence to support any one of them. It was established beyond a doubt that the lady,

*This is scarcely the case. According to Krafft-Ebing the majority of masochists find satisfaction in being trodden upon; but some cases he brings forward (*e.g.*, that of Cox[37]) show no signs of masochism, since, according to Krafft-Ebing's own definition (p. 116), the idea of subjugation of the opposite sex constitutes the essence of masochism.

[1]Read before the Chicago Academy of Medicine, Dec. 8, 1905.
[2]Medical Jurisprudence, III.
[3]Judicial Puzzles.

though apparently conducting herself like other people and giving no external sign of disordered intellect, was upon this particular subject altogether insane, that the doctor was innocent throughout the affair and wholly unconscious that he had for years been made the hero of a romance rivaling the "Adventures of Faublas."

This morbid state sometimes assumes a form even more dangerous than that of self-accusation. A crime is committed or supposed to have been committed. The details of an inquiry of an exciting nature fill the columns of the press. Presently the imagination fastens upon the circumstances as they are gradually revealed, and the unfortunate patient fancies that he has been a witness of the whole transaction; he comes forward believing that he is discharging an imperative duty, and with all the clearness, coolness, and certainty characteristic of truth, deposes to the creation of his heated brain. A case of this kind occurred at the winter assizes at Stafford, England, in 1857. The body of a girl named Elizabeth Hopley was found in the canal at Bradley early on the morning of April 30. There were no marks of violence. About ten o'clock on the previous evening she had left the house of her aunt for the purpose of going to the place where a young man to whom she was engaged to be married was in the habit of working. Her road led past the place where her body was found, and it was supposed that, dazzled by the light of some coke fires, she had missed her way and fallen over the low wall by which the canal was at that spot very insufficiently guarded. About three weeks after the girl's death a neighbor (Samuel Wall) declared that Elizabeth Hopley had been murdered and that he had been present when the crime was committed. A day or two afterward he was summoned before the magistrate, when he told the following story. He said that on the night of April 29 he was on duty as a private watchman on some premises near the bridge which crossed the railway, that he saw two persons, a man and a woman, on the bridge and heard a woman's voice say, "Philip, don't kill me! You said you would kill me before." That the man then raised his hand and struck the woman a violent blow on the head which knocked her down. Upon this he went up and instantly recognized the man as Philip Clare, whom he well knew. He exclaimed, "Philip, you'll have to suffer for this." Clare turned and replied, "If you speak I will serve you the same." Clare then lifted the young woman up from the ground, and followed by Wall carried her over the railway bridge and down a road past some cottages until he came to the canal. Here he paused, and turning round again upon Wall said: "Now if you speak or tell any one I will kill you. I will serve you the same way as I served her and set some one else to watch instead." He then in Wall's presence plunged the woman, who still seemed helpless and insensible, into the canal close to the spot where the next morning her body was discovered.

Wall fixed the time when this occurred as twenty minutes after midnight. He was employed as a watchman and was likely to be habitually observant of the time. He said that he returned to his employer's premises, being prevented by his fear of Clare from giving any alarm; after about a quarter of an hour had elapsed Clare came to him and renewed his threats, and terrified by the apprehension of immediate violence he locked himself up in the engine-house until daylight. Upon the statement Clare was taken into custody and committed for trial. At this trial Wall repeated the story he had told the magistrates. There was a total absence of confirmation. It was met by proof that the body showed no sign of having received any blow of the kind described by Wall, that there had been men at work pumping water during the whole night

in the immediate neighborhood who must in all probability have heard something had the affair taken place as Wall described. It was shown, moreover, that from half-past six until about eleven P.M. Clare had been in a public-house at Bilston, which he left in company with four other men, one of whom accompanied him till within half a mile of his own house. Another witness, a neighbor, proved that about twelve o'clock he met Clare and entered into conversation with him near his own door; that they remained together until two o'clock next morning. There could not be the slightest doubt of Clare's innocence, and the jury of course acquitted him. Nor could there be any doubt that Wall believed the story told. The minuteness, the peculiarity, the graphic details, the conversation, all bear the stamp of that subjective truth which our language has no word to distinguish from objective truth. It is curious to observe in how many respects this case resembles that of John Perry. In both there was a period of incubation during which the mind brooded in silence over its creations; in both the accuser professed to have been present and thus a participant, though in different degrees, in the crime; in both the conversation with the supposed murderer is minutely detailed; in both the tale is solemnly repeated consistently and without variation at considerable intervals of time and subject to the test of judicial examination; in both the accused was acquitted.

A gentleman of high social position instituted divorce proceedings against his wife. The innocence of the lady was strongly asserted and firmly believed. Counter charges of conspiracy and perjury were brought against the husband and his witnesses. The lady herself was in a state of disordered intellect, produced, it was asserted, by the conduct of the husband, which precluded her from taking any part or affording any assistance toward her own defense, which, however, was vigorously sustained by friends firmly convinced that she was wholly innocent. The inquiry lasted for nearly four years, and at length reached the House of Lords, where the case on behalf of the husband had just terminated when Parliament rose for the Easter recess.

On the House reassembling there appeared at the bar an elderly and respectable looking clergyman, who to the surprise of every one deposed upon oath that six or seven years before, namely, in the month of May or June, in the year 1840 or 1850, he could not say which, he had been an actual eye-witness of the guilt of the lady. He swore that he had never mentioned the circumstances during the six years that had elapsed but to one person, and that person was dead. He had permitted his daughters and sisters to continue on terms of intimacy with the lady whom he accused. He was unable to fix the time of the occurrence even as to the year in which it took place, or to state who was the partner in her guilt. Every avenue of contradiction was thus cut off, and the story was left to stand or fall, according to whether respectable character and social position of the witness and apparent conviction with which he told his story, or the improbable nature of that story itself, coupled with the fact that, during a most searching investigation carried on by adverse parties with the utmost eagerness for a period of between four or five years, no circumstance which in the slightest degree corroborated that story had ever come to light, might be considered to be entitled to the greater weight. It was not long, however, before the difficulty was solved. Within a few months the witness who had told this extraordinary history gave himself up to justice, declaring with every expression of contrition that he had been guilty of forging certain bills of exchange, that they had nearly reached maturity, that he had no means of providing for them, that detection was inevitable, and that he wished to anticipate the blow and

make such reparation as was in his power by a full acknowledgment of his guilt. Upon investigation it turned out that there was not the slightest foundation for his story; no forgery had been committed, no such bills of exchange had been in existence. His delusion as to his own guilt was as complete as his delusion as to that of the lady against whom he had given evidence, over whose strange history he had no doubt brooded for years until the thick-coming fancies of his brain assumed the form and appearance of substantive creations.

Dr. Southwood Smith, after observing how common false self-inculpatory evidence is, gives some remarkable instances in which it has occurred. Of these the following is perhaps the most striking: During the French Revolution the frigate *Hermione* was commanded by Captain Pigot, a harsh, severe commander. His crew mutinied and carried the ship into an enemy's port, having murdered the captain and many of the officers under circumstances of extreme barbarity. One midshipman escaped, by whom many of the criminals, who were afterward taken and delivered over to justice one by one, were identified. Mr. Finlaison, the government actuary, who at that time held an official situation at the Admiralty, stated:

"In my own experience I have known on separate occasions more than six sailors who voluntarily confessed to having struck the first blow at Captain Pigot. These men detailed all the horrid circumstances of the mutiny with extreme minuteness and perfect accuracy; nevertheless, not one of them had even been in the ship nor had so much as seen Captain Pigot in their lives. They had obtained by tradition from their messmates the particulars of the story. When long on a foreign station, hungering and thirsting for home, their minds became enfeebled; at length they actually believed themselves guilty of the crime over which they had so long brooded, and submitted with a gloomy pleasure to being sent to England in irons for judgment. The Admiralty was always able to detect and establish their innocence in defiance of their own solemn asseverations."

A magistrate of one of the northern counties of England, well known for his active benevolence during the discharge of his duty, and one of the visiting justices of the County Lunatic Asylums, entered into conversation with one of the patients, and was much struck with his rational demeanor and sensible remarks. The man expressed himself grateful for the kindness with which he was treated and said he was well aware that it was necessary that he should be under restraint, that although he was perfectly well at that time he knew that he was at any moment liable to a return of the insanity, during an attack of which he had some years before murdered his wife, and that it would be unsafe to permit him to go at large. He then expressed the deepest contrition for his crime, and after some further conversation the magistrate left him, not doubting the truth of his story. Referring to the case in conversation with the master of the asylum he expressed much interest and referred to the patient as that unhappy criminal lunatic who had murdered his wife, when to his astonishment he was informed that the wife was alive and well and had been to visit her husband only the day before.

The old jurist Heineccius remarks that while "confession is sometimes the voice of conscience, experience teaches us that it is frequently far otherwise. There sometimes lurks under the shadow of an apparent tranquillity an insanity which impels men readily to accuse themselves of all kinds of iniquity. Some, deluded by their imaginations, suspect themselves of crimes which they have never committed. A melancholic temperament, the *tædium vitæ*, and an unaccountable propensity to their own destruction urges some to the most false con-

fessions, whilst they are extracted from others by the dread of torture or the tedious misery of the dungeon. So far is it from being the fact that all confessions are to be attributed to the stings of conscience that it has been well said by Calphurnius Flaccus: 'Even a voluntary confession is to be regarded with suspicion.' According to Quintilian a 'suspicion of insanity is inherent in the nature of all confessions.' "

In the Boorn case the social dangers of the "sweat-box" were peculiarly well illustrated. Mr. Boorn and his aged wife were respectable inhabitants of Manchester, Vermont. They had a son and two daughters besides the unhappy victims, Stephen and Jesse.

Sally, one of the daughters, became the mother of several children by a man named Colvin, all of whom were dispersed among their relatives owing to the mental derangement of their father, which rendered him incapable of attending to his family concerns and of providing for them necessary support. Mr. Colvin was in the habit of frequently absenting himself without giving previous information, and rambling in various parts of the country. At one time he was absent as long as nine months, after which he was found in Rhode Island. About eleven years after his marriage to Miss Boorn he was again missing, which at the time caused little or no alarm, as it was expected that he would return as on former occasions. But after a lapse of several years, nothing having been heard of him, surmises were circulated that he had been murdered. Suspicion rested on his brothers-in-law, Stephen and Jesse Boorn. This suspicion was created by a reference to the frequent altercations that had taken place between Colvin and the Boorns previous to the disappearance of the former, and to some unguarded expression of the latter afterward intimating that Colvin was dead, and by their occasionally showing some signs of compunction.

A Mr. Boorn, uncle to Stephen and Jesse, a respectable gentleman of unimpeachable character, dreamed that Russell Colvin came to his bedside and told him that he had been murdered. This dream was repeated three times. The place which had been talked of previous to the dream was where a house had formerly stood, and under it was a hole about four feet square which was made for burying potatoes, and then filled up. This pit was opened, and nothing discovered but a large knife, a penknife, and a button. Mrs. Colvin, anterior to their being presented to her, described them accurately, and on seeing them said all but the penknife belonged to her. A lad was walking from Mr. Boorn's a small distance with his dog; a hollow stump standing near the path engaged the notice of the spaniel, which ran to the place and back again several times, lifting up his feet on the boy with whining notes as though to draw the attention of his little master to the place, which had the effect. A cluster of bones was drawn from the roots of the stump by the dog's paw. Further examination was made, and in the cavity of the stump were found toe-nails apparently belonging to a human foot; others discovered in a crumbled state had to all appearance passed through the fire. It was now concluded by many that fragments of the body of Russell Colvin had been found. The cluster of bones was before the court of inquiry. They were examined by a number of physicians, who thought them to be human; one thought otherwise. A Mr. Salisbury about forty years previously had his legs amputated. These were dug up, and by comparison it was determined that the bones were not human. However, it was clear to all beholders that the nails were human. The bones were in a degree pulverized, but some pieces were in a state of preservation. Suspicions were excited that the body was burnt and some parts not consumed cast into the stump, and other bones put

among them for deception. Some time after the departure of Colvin a barn belonging to Mr. Barna Boorn was consumed by fire accidentally. It was conjectured that the body was taken up and concealed under the barn and mostly consumed. About that time a log heap was burnt by the Boorns near the place where the body was supposed to have been disposed; it was also charged that it was consumed there.

Previous to the general excitement Stephen Boorn with his family moved to Denmark, N. Y. Jesse remained in Manchester, where he was arrested and frequently brought before a court of inquiry. He at first boldly asserted his innocence, but after several days' confinement and every art used to induce him to criminate himself and his brother, being told that a confession would probably be the means of obtaining his liberty, he confessed that Stephen had told him that he (Stephen) had given Colvin a blow, and laid him aside where no one could find him. Upon this the justice issued a warrant against Stephen. Capt. Truman Hill, grand juryman for Manchester, Squire Raymond, and Mr. R. Anderson set out for Denmark, arriving there in three days. They called on Mr. Eleazer Sylvester, innkeeper, who in the night, together with a Mr. Orange Clark and Mr. Hooper, belonging to the town, accompanied them to the house of the alleged criminal. Mr. Clark went in first and began some general conversation. The others surrounded the house, and Boorn was easily taken. The distress of Mrs. Boorn excited the compassion of those who had come to arrest her husband, and they made her some presents. The prisoner was ironed and brought to Manchester. He peremptorily asserted his innocence, and declared that he knew nothing about the murder of his brother-in-law. The prisoners were kept apart for a time and assigned to separate cells. Nothing material transpired, and they were afterward confined in one room.

Stephen denied the evidence brought against him by Jesse, and treated him with severity. Both prisoners were repeatedly admonished to pay the strictest regard to truth. Many days were taken up in public examination of the reputed criminals. Circumstantial evidence brought forward was so much against them that they were bound over to the Supreme Court at Manchester September, 1819. Jesse Boorn, after an interview with his brother, denied that Stephen ever told him that he killed Colvin, and what he reported about him was false. For some time they both continued to assert their innocence, but being told that they would undoubtedly be convicted upon the testimony already against them, and hopes of pardon being held out if they would confess the crime, at last Stephen wrote a statement of what he said were facts, in which he acknowledged he killed Colvin, deposited him in the place where the knife and button were found, that he took the bones from that place and put them under his father's barn, which was soon after burned, and the body was principally consumed.

A person in jail for perjury testified to a full confession of the murder made to him by Stephen and Jesse, which was so artfully framed to corroborate other details that it had great weight with the court and jury, though it was wholly false. But the perjurer got bail thereby, and absconded. The prisoners were frequently visited by the Rev. Mr. Haynes, who did not discover any compunction; both persisted in declaring their innocence, with appeals to Heaven. Stephen particularly at times appeared passionate and impatient. One day Mr. Haynes cited the example of Christ under suffering as worthy of imitation. Stephen exclaimed, "I am as innocent as Jesus Christ," for which alleged extravagant expression he was reproved. He replied, "I don't mean that I am as guiltless as He was; I know I am a great sinner, but I am as innocent of killing Colvin

as He was." The court sat in September, and a judicious and impressive charge was given to the grand jury by Judge Doolittle. A true bill of indictment was found against Stephen and Jesse Boorn, but as it was not a full court the trial could not commence. The court adjourned to October 26, 1819. With much difficulty a jury was obtained. The court ruled that Stephen and Jesse Boorn should be jointly tried for the murder of Russell Colvin.

About fifty witnesses were examined corroborative of each other, their testimony tending to prove the leading facts. The jury retired, and within one hour returned and gave a verdict of guilty. On being polled each agreed that they had found the prisoners guilty of murder as charged. After a short recess Judge Chase sentenced the prisoners to be remanded back to prison, and January 28, between the hours of 10 and 2 o'clock, to be hanged by the neck until they were dead.

Mr. Taber Chadwick, of Shrewsbury, Monmouth county, N. J. (brother-in-law of Mr. William Polhamus, of Dover, N. J., where Colvin had lived since April, 1813), saw the account of the Boorn trial at Manchester, and wrote that Colvin was still alive, and with his brother-in-law, Polhamus. When the letter arrived in Manchester there was general consternation. Most doubted. Mr. Chadwick's letter was carried to the prison and read to Stephen; the news was so overwhelming that, to use his own language, "nature could scarcely sustain the shock." As there was some doubt as to the truth of this report it tended to prevent an immediate dissolution. Stephen believed that had Colvin then made his appearance it would have caused his own immediate death; even now a faintness was created that was painful to endure. Soon a letter was received from New York stating that the man supposed to be murdered was still alive.

Mr. Whelply (formerly of Manchester), who was intimately acquainted with Colvin, had actually gone to New Jersey in quest of him. There was therefore increasing evidence of the truth of the letter. Whelply on return to New York immediately wrote that he had Colvin with him. A New York paper announced his arrival, and that he would soon set out for Vermont. Notwithstanding all this, many considered the report a mere fabrication. Large bets were made. Colvin was unwilling to return to Vermont with Mr. Whelply, who was obliged to have recourse to stratagem. A young woman of Colvin's acquaintance agreed to accompany him, pretending that she designed merely to visit New York. While there she was missing, which excited some uneasiness in the mind of the exile.

While staying a few days at New York, to prevent Colvin returning Mr. Whelply told him there were British men-of-war lying in the harbor, and unless he kept within doors he would be kidnaped. This had the desired effect. Colvin, when he set out for Manchester, concluded that he was on his way home to New Jersey, and never perceived the deception until he came to Bennington, December 22. He saw many people with whom he had formerly been acquainted, which filled him with surprise. The county court being in session, all present were astounded. The court suspended business for some hours to gaze upon one who legally had been dead and yet was still alive. Stephen and Jesse were soon at liberty.

Of the dangerous results of the illegal torture called the sweat-box the Sleuder case was a marked example. Sleuder, put into the sweat-box, confessed the Chicago car-barn banditry in a manner suspiciously confirmatory of the theories of the police. Accident led to the discovery of the real bandits and settled the innocence of Sleuder. Despite this notorious failure of the sweat-box, this violation of law still continues.

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The Mississippi Supreme Court in reversing and remanding the case of Ammons *vs.* State said:[1] The chief of police testified that the accused made to him a "free and voluntary statement." The circumstances under which he made it were these: There was what was known as a "sweat-box" in the place of confinement. This was an apartment about five or six feet one way and about eight feet another. It was kept entirely dark. For fear that some stray ray of light or breath of air might enter without special invitation, the small cracks were carefully blanketed. The prisoner was allowed no communication whatever with human beings. Occasionally the officer, who had him put there, would appear, and interrogate him about the crime charged against him. To the credit of our advanced civilization and humanity it must be said that neither the thumbscrew nor the wooden boot was used to extort a confession. The efficacy of the sweat-box was the sole reliance. This, with the hot weather of summer, and the fact that the prisoner was not provided with sole-leather lungs, finally after "several days" of obstinate denial accomplished the purpose of eliciting a "free and voluntary" confession. The officer, to his credit, says he did not threaten his prisoner, that he held out no reward to him, and did not coerce him. Everything was "free and voluntary." He was perfectly honest and frank in his testimony, this officer was. He was intelligent, and well up in the law as applied to such cases, and nothing would have tempted him, we assume, to violate any technical requirements of a valid confession—no threats, no hope of reward, no assurance that it would be better for the prisoner to confess. He did tell him, however, that "it would be best for him to do what was right," and that it "would be better for him to tell the truth." In fact, this was the general custom in the moral treatment of these sweat-box patients, since this officer says: "I always tell them it would be better for them to tell the truth, but never hold out any inducement to them." He says in regard to the patient Ammons: "I went to see this boy every day and talked to him about the case, and told him it would be better for him to tell the truth; tell everything he knew about the case." This sweat-box seems to be a permanent institution, invented and used to gently persuade all accused persons to voluntarily tell the truth. Whenever they do tell the truth—that is, confess guilt of the crime—they are let out of the sweat-box. Speaking of this apartment, and their habit as to prisoners generally, this officer says: "We put them in there (the sweat-box) when they don't tell me what I think they ought to." This is refreshing. The confession was not competent to be received as evidence.[2] Defendant unless demented understood that the statement wanted was confession, and this only meant release from this "Black Hole of Calcutta."

Such proceedings as this record discloses cannot be too strongly denounced. They violate every principle of law, reason, humanity, and personal right. They restore the barbarity of ancient and medieval methods. They obstruct instead of advance the proper ascertainment of truth. It is far from the duty of an officer to extort confession by punishment. On the contrary, he should warn his prisoner that every statement he may choose to make may be used against him on his trial.

The psychic factors which produce false confessions underlie the mental state of the dying. The exhaustion which produces resignation is an apathetic condition which is decidedly predisposing to suggestion or undue influence. The irritable suspicional state so often present readily lends itself to suggestion. It predisposes to false accusation based on a desire for vengeance. While dying declarations are

[1] 32 Southern Reports, 9.

[2] 6 Am. and Eng. Ency. of Law, p. 531, note 3.

popularly supposed to be peculiarly veracious, neither law nor experience justifies this opinion. A dying declaration, according to the Illinois Supreme Court,[1] is but secondary evidence, and it is error to instruct the jury that such declaration is the testimony of one witness and is entitled to such weight as it would be entitled to had it been stated to the jury by one witness. Dying declarations may be impeached in any of the modes by which the evidence of the declarant could have been impeached had he or she been alive and testifying in open court. When a dying declaration that the accused had given the declarant whisky and strychnine is given in evidence, the accused may show that the declarant entertained a spirit of malice and revenge toward him because he had abandoned her on account of her habits and had filed a bill of divorce against her for habitual drunkenness. Where the charge against the accused is that he gave his wife a bottle of whisky and strychnine, it may be shown that she kept whisky and strychnine in her room after her separation from her husband, and as explanation of such act and as part of the *res gestæ* it may be shown that she was despondent and made declaration tending to show an intent to commit suicide. Dying declarations may be impeached by proof of contradictory statements on material points, even though such contradictory statements are not made *in extremis*.[2]

The validity of dying declarations therefore requires certain tests. The persons must know that they are dying. The mind must be clear from mental perturbation. The declaration must be spontaneous, free from any outside suggestion whatever. The possible influence of feeling against the person accused must be taken into account.[3]

In a case in which I was lately retained by Mr. R. E. Cantwell a woman epileptic was found with the left parietal bone broken, lying in a pool of blood near a fender. Both eyes were blackened, but there was an occipital contusion. She was sent to the county hospital. Here trephining was done, resulting in extensive hemorrhage from the middle meningeal artery, followed by collapse and transfusion of normal salt solution. Soon after several severe epileptiform attacks occurred. These were followed by a semistuporous state with some failure of vision. While in this state her husband was brought into her presence. She was asked if he had struck her, but no attempt was made to determine whether she regarded herself as dying, nor to apply any of the tests laid down by the Supreme Court, nor to settle whether she recognized her husband. She soon rallied, and according to the interne thereafter became as "clear as a bell." During this state of mental clearness she voluntarily and spontaneously made a statement that her injuries had been received from an accidental fall. The police resisted an attempt to secure release of the husband on bail on the ground that she was insane when the voluntary statement was made. On examination I found that she believed she was going to recover; that she believed her injury to be the result of a fall; that she was very anxious to see her husband, and complained bitterly that he had not been to see her since she was in the hospital; that she could not see clearly since she mistook every man who came near her for the husband, but admitted the error when told of it. When told that her husband was in jail charged with assault upon her, she asked who had told that lie, and when informed of her alleged dying declaration, promptly repudiated it as never made by her. Bail was promptly accorded by Judge McEwen on statement of these facts. In this case the sweat-box identification system of the police was clearly evident. The police opposed the

[1]Nordgren *vs.* People, 211 Illinois Reports, 425.
[2]Dunn *vs.* People, 172 Illinois Reports, 582.
[3]211 Illinois Reports, 425.

bail, not with medical or other evidence, but with the unsworn statements of hearsay by a patrolman.

The spite element of a dying declaration is a serious danger to the general practitioner. While poison accusations are not exceptionally rare, abortion accusations are far from infrequent. Out of spite abortion victims often accuse physicians who have refused to perform abortion from the feeling that the skill of the physician would have saved them suffering and death, whence their attempt at vengeance. The common law here, as so often elsewhere, is, from its scientific principles of evidence, amply sufficient to prevent injustice, but obedience to it must be enforced on police and public officials, who seem at present sadly destitute of a knowledge of its principles.

TUBERCULOSIS OF THE MALE GENITO-URINARY SYSTEM—A REVIEW.*

BY J. A. PATTON, B.S., M.D.

Tuberculosis of the male genito-urinary system is of great importance to the general practitioner. Its early recognition often falls to him, and an early diagnosis is of inestimable value, many times determining whether palliative or radical measures shall be used.

Heiberg[2] states that it is possible in the genito-urinary tract to demonstrate the local origin of tuberculosis and its successive propagation as nowhere else. In this field therapeutic interference should depend upon its recognition as protopathic or deuteropathic. The question of primary or secondary infection, the frequency of its occurrence, the age at which it is found, and the ratio of males and females need accurate clinical and post-mortem statistics on the one hand of tuberculosis of the lungs and bones, and on the other of the genito-urinary system. There are no such statistics at present. In 18,834 autopsies reported by Saxtorph,[3] Posner,[4] Krzywicki,[5] and Heiberg[2] were given 844 cases of genito-urinary tuberculosis, or about 4.5 per cent. Genito-urinary tuberculosis is most frequent from 20 to 35 years of age, or during the strongest sexual and arterial tides of life, though it may appear at any age. Saxtorph's[3] and Heiberg's[2] autopsy reports show a preponderance of genito-urinary tuberculosis in males and tend to prove that urinary tuberculosis is rarer in females than the genital form. Together they report 289 cases: genital, only 105—60 males and 45 females; urinary, only 60; genito-urinary, 124—97 males and 27 females. Klieneberger[6] reports 54 cases of female genito-urinary tuberculosis—17 genital, 8 urinary, and 29 genito-urinary.

Virchow states that tuberculosis of the testis may occur protopathically, without a preceding pulmonary tuberculosis. A majority of the cases are deuteropathic, but it is hard to prove or exclude the presence of hidden foci in the body or traces of long-healed tuberculosis, many times not found even post mortem. The protopathic are clinically hard to prove, and we can be relatively positive of the form only by exact anatomical examination. Many genito-urinary tuberculous cases have no traces of a former tuberculosis; others may show apex scars, bone scars, old scrofulous or tuberculous gland scars. Heiberg's[2] 84 cases were 29 primary and 55 secondary. He says if they are healed and the former tuberculosis extinguished we may regard the genito-urinary form as primary. But it is known that the tubercle bacillus may lie dormant for years and then become active and reinfect the indi-

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vidual. The favorable and lasting results of early surgery in many cases speak for the primary form.

J. Israel in a large number of urinary tuberculosis cases has found the kidney the only or the first organ affected. The primary renal tuberculosis was proven by surgical, post-mortem, cystoscopic, and clinical evidence. Saxtorph[3] found primary renal tuberculosis in 23 of 205, and Collinet[7] in 10 of 70 cases.

The testis and epididymis are second in frequency of primary infection, Saxtorph[3] finding it in 10 of 205, Heiberg[2] in 15 of 84, and Collinet[7] in 9 of 70 cases.

Prostatic primary infection was reported by many of the older observers, but the later reports are more accurate, Saxtorph[3] finding 9 in 205, Heiberg[2] 10 in 84, and Collinet[7] 2 in 70 cases.

Primary infection of the seminal vesicles was found by Saxtorph[3] in 2 of 205 and by Heiberg[2] in 8 of 84 cases. No positive cases of primary infection of the bladder and urethra were found by these observers.

The prostate and seminal vesicles are seldom primarily affected, but are usually secondary to the kidney or testis infection. The course is the same, but the localization differs. Secondary infections have their seat more often in the urinary organs than the primary, as the bacilli reach the genito-urinary tract through the blood and leave through the urine. Heiberg[2] found the urinary organs attacked in 13.8 per cent in primary and in 25.5 per cent in secondary genito-urinary cases. Statistics of relative frequency show kidney, testis, and epididymis are most frequently involved, and in the order named the prostate, seminal vesicles, posterior urethra, bladder, and anterior urethra.

The points or routes by which the infection enters the different genito-urinary organs are of prime importance as a basis for therapy. Virchow states that it is necessary in almost all forms of dyscrasia to determine the local origin and external cause. Recognition of the routes followed in the urinary and genital tracts and the determination whether there is an ascending or descending form require brief consideration.

The female urinary and genital tracts are separate, but the male's are not, hence the latter usually have both infected, if either. The male urethra forms the entrance to the genital glands and the kidneys, or rather it is the excretory duct of both. Because of this anatomical relationship disease of one system usually affects the other.

Involvement of the posterior urethra is seldom absent in protracted genito-urinary tuberculosis. The anatomical structure of the posterior urethra, which forms a cross-way for the urinary and genital tracts, renders it more easily infected than the anterior urethra.

Tuberculosis of the anterior urethra is rare, often escaping detection, but it does exist, having been described by many. It is most often found in youths or young men. It is doubtful if it is ever primary, even when it occurs in the stump after ritual circumcision. It is usually secondary and hematogenous in type. The symptoms are pain on urination, urethral hemorrhage, stricture with no history of gonorrhea or trauma, a sero-purulent discharge, often with no bacilli for a long time. In making a diagnosis the microscope, sounds, and palpation of the urethra can be employed, but urethroscopy is the best diagnostic measure. This form frequently suppurates, forming fistulæ, and it may cicatrize, forming strictures. Treatment by incision, curettage, partial or total amputation has given permanent relief, but the associated foci in the upper part of the genito-urinary tract must be treated.

The posterior urethra is a favorable site for tuberculous infections, 67 of 72 autopsies of

severe cases showing its involvement. The membranous part is never diseased alone, but there is always an accompanying prostatic and adnexa involvement. The changes rarely extend to the anterior urethra, the extent and frequency decreasing from the rear to the front. All forms of mucous membrane tuberculosis may occur, from mild granulations to ulcerations, cheesy degenerations, and cavities, frequently with destructive changes in the prostatic urethra. Infection of Littre's and Cowper's glands may be particularly severe; timely incision and excision will alone prevent the abscesses and cheesy cavities. The prostatic urethra rarely has scar tissue or strictures, and it is rarely infected without the prostate, but when degenerated the passage of instruments may be difficult. It may be primary, but is usually secondary, the latter being due to direct contact with prostatic and seminal vesicular foci, which are always severe. The primary originating without this direct connection are much more frequent. The posterior urethra combines several favorable etiological factors, as direct inoculation of the mucous membrane can occur; in addition it has the openings of the mucous glands, the excretory ducts of the prostate, the caput gallinaginis, ductus ejaculatorii, and the utricle whose sinuous form has 100 to 200 small glands, and finally the seminal vesicles, convoluted long blind sacs lying at the juncture of the vas deferens with the ductus ejaculatorii. The genito-urinary crossway receives secretions from three possible tuberculous sources—the urine, semen, and secretions from the prostatic glands, all of which may contain bacilli. It cannot be separated from prostatic and seminal vesical involvement. The urethroscope aids diagnosis and treatment, early signs of infection being seen around the caput gallinaginis.

The prostate is penetrated by the ductus ejaculatorius and the urethra, hence bacilli may reach it from the testis and kidney. It may be primarily infected, three old infections of the prostate having been found in fifteen cases of miliary tuberculosis. The prostate readily takes up disease products, as in pyemia, glanders, etc., and gonorrheal infection predisposes to tuberculosis, though the latter is usually secondary to involvement of the lungs, bones, or kidney. The infection may be very destructive because of the anatomical structure and relations. The prostate has been found diseased in about 80 per cent of genito-urinary cases, the miliary form being of little interest compared to the chronic surgical form. The prostate may show any or all forms of tuberculous degeneration, the primary tubercles developing near the gland lobules and their excretory ducts, and become cheesy, followed by abscesses, encapsulation, or connective tissue induration. If the tubercles are interstitial and are isolated from the urethra, medical treatment alone is often sufficient in the initial and even cheesy stages. Abscesses tend to perforation and to empty externally. Encapsulation or abscess formation depends upon the intensity of the process, extent and frequency of the lesions, virulence of the bacilli, addition of secondary infection, difference in blood-supply, and the resistance of the different regions of the prostate. All stages may be recognized by physical examination. Even initial tubercles, central and impalpable, cause congestion and increase in size of the prostate, while if further developed a rectal examination will show characteristic indurated nodules separated by normal areas, also soft areas and abscesses. If the capsule is broken and periprostatic abscesses form there may be an exudate of large size in the true pelvis.

The seminal vesicles are frequently diseased, and usually bilaterally. The coexistence of infection of the epididymis and prostate makes it appear secondary, and it is seldom primary.

Saxtorph found it in 7 of 205 cases. The infection may be hematogenous as well as by contact, but it is mostly infiltrative. Rectal examination reveals a sausage-shaped, doughy protrusion with cheesy contents, the walls being rarely affected.

The treatment of the seminal vesicle is very important, as connective tissue encapsulation and atrophy are frequent. No other genito-urinary organ shows such decided healing tendencies. Pus has never been found to pass forward through the ejaculatory duct when abscesses form. Perivesiculitis may break into the rectum and toward the perineum, or may cause pelvic peritonitis. It may cause extensive destruction in the genito-urinary crossway. Large cavities may form and interrupt the passage of instruments and render possible secondary urinary infection with burrowing and pelvic abscesses. Surgical interference is often demanded in these cases.

Two series of organs are of special interest in the origin and therapy of genito-urinary tuberculosis—the testis, epididymis, and vas deferens, and the kidney, ureter, and bladder. The tuberculous epididymis and testis are frequent, being more often unilateral than bilateral, Haas[8] finding the latter in 38 per cent of 111 cases. The secondary infection theory is no longer tenable, since it is proven that tuberculosis of the epididymis is most frequently primary. The very young show primary infection in the testis: Kraemer[9] thinks it congenital, and Geraldès found a tuberculous testicle in a full-term fetus. Primary epididymis cases are often not seen until the infection has spread by the hematogenous route or by contiguous mucous membrane, but Virchow has shown the first appearance in the epididymis. Tubercle bacilli are caught in the rete testis or in the curves of the epididymis canals, especially where the efferent canals are obliterated by trauma or gonorrhea. Kocher[10] and Simmonds[11] have shown the first change to be a catarrh of these small canals. Langhans[12] found first nodules; these may become cheesy, and in far-advanced cases may reach the testis. They may heal spontaneously. The epididymis is usually first and most severely affected, and then the testis, but more often the epididymis and vas deferens are involved together. The vas deferens is always more diseased in the lower than the upper parts, and the process is not continuous, the disease being most likely to be found at the bends. The upper part is involved when the extension is from the seminal vesicles, and may thence continue to the epididymis. In addition to intracanalicular, hematogenous, and congenital modes, aided by external lesions such as trauma and gonorrhea, tuberculosis may originate by lymphatic extension where there is a patent processus vaginalis in cases of tuberculous peritonitis. The lymphatic route aids bilateral infection.

The bladder is infected from the kidneys and the sexual glands, but this is rare in proportion to the other genito-urinary organs. It proves that the primary hematogenous route is hardly to be considered, a fact which holds good for miliary tuberculosis. The virus easily reaches the bladder from a primary kidney infection and readily gains a foothold; usually the first foci are found on the trigonal mucous membranes nearer the ureteral orifice of the diseased side. Cystoscopy is the only method of recognition in the early stages, and is important in therapy before infiltration, ulceration, and extension occur. The bacilli are more easily found early than after ulceration, as the pus, urinary decomposition, and secondary infection cause cystic changes which are especially destructive to the nodules. Clinical symptoms vary with the physical changes from almost none in the initial stages to the severest symptoms. In the absence of the characteristic nodules it is hard to differentiate tubercu-

losis from diphtheric purulent inflammations. It may be recognized before the nodules appear by a roughening of the ureteral openings, which become inverted, angular, and funnel-shaped, with a dark center instead of the normal pale-red superficial depression with smooth edges. The more advanced the renal tuberculosis the slower the urine flows, this being readily observed at the ureteral openings.

Frank[1] states that no method replaces cystoscopy in the examination of these cases, but Nitze[13] and Caspar[14] do not agree with him. Cystoscopy is the only way to catheterize the ureters and get the necessary facts regarding renal functional power, though it may do harm in vesical tuberculosis unless used skilfully and at the right time. Deep inflammatory changes may produce diminished lumen by interstitial contraction or superficial ulcerations through cystospasm. Both types are characterized by a troublesome desire to urinate, accompanied by pain, and the cystoscope as well as all other instruments should not be used. Treatment will lessen the irritation, and the bladder can be examined under local anesthesia. It should be filled with the non-irritating 1:4000 solution of oxycyanate of mercury instead of boric acid solution. This method never causes extension of vesical tuberculosis in Frank's experience. It cannot be used in advanced cases; but in these a cure is out of the question. Cystoscopy is always indicated where it is technically possible. Primary tuberculosis of the bladder is described, but clinical and autopsy findings are against this theory. The bladder is rarely diseased in miliary tuberculosis, the form *par excellence* for the hematogenous route of infection. Usually vesical tuberculosis is secondary by an extension from the kidney, and rarely from the genital organs, probably never in the female.

The localization and routes of entrance of primary and secondary tuberculosis processes of the genito-urinary system, whether ascending or descending, are important points in therapy. Though tuberculosis of these organs almost always begins in their depths, yet that is not sufficient proof that the bacilli enter by the urethra. Heiberg[2] says "the initial focus is always seen in the furthermost portion of the efferent duct at the point where this joins the gland tissue proper," and Virchow has shown that tuberculosis of the testis begins in the epididymis, particularly in its head.

Animal experiments and clinical cases indicate that the urethra and vagina may be primarily infected. Guinea-pigs with bacilli injected into the testis have infected females, but similar results are not found in men; even when the latter have extensive involvement of the genito-urinary system the wives escape local infections of the vagina. Many cases are known in which healthy children have been born and the mother and children remained healthy for many years. Primary genito-urinary tuberculosis has never been found in prostitutes, who must have frequently cohabited with tuberculous men. Admitting meatus infection or foreskin or glans surface, the infectious agents would pass to the inguinal glands and not to the deep genito-urinary organs, as was illustrated in a case of ulcer of the penis for fourteen years without deep involvement. It would seem to be possible to communicate tuberculosis by direct transmission, as in syphilis and gonorrhea, but there is no positive proof of it. It may be primary, but is usually secondary, and mostly in those hereditarily affected or otherwise disposed to tuberculous disease. All that is needed is a lessened resistance to determine localization in the genito-urinary tract. Statistics show that trauma is the principal cause of genito-urinary tuberculosis. Haas found 11 of 13 cases of tuberculous testes which gave a history of recent trauma, and the intervening time was too short to allow of

hematogenous development. Gonorrhea is an important cause of genito-urinary tuberculosis, and in this respect only is the former sexual life of value in diagnosis and treatment. Gonorrheal epididymitis favors retention of the bacilli and their penetration into the tissues, due to stenosis and obliteration of the efferent canals. Tubercular testis is preceded frequently by gonorrheal epididymitis on the same side. Gonorrhea has preceded tuberculosis in 33 1/3 per cent of 113 cases; many of these were hereditarily predisposed. Tuberculosis of the prostate is often favored by a posterior urethral gonorrhea which persists in the gland tubuli, its efferent ducts, the utricle, and seminal vesicles. Glandular infiltrations and strictures favor stagnation with resulting invasion of the bacilli. The prevention of gonorrhea is important for all phthisical patients, especially those with hereditary taint. Infection may be through the blood to the urinary or sexual organs, or by contact along the mucous surfaces of canaliculi or cavities, or it may be congenital. The question whether infection was ascending or descending was disputed until recently, but it is now thought to be a descending infection, or in the direction of the flow of the secretions of the transmitting organs. The bacilli are non-motile and will not travel against the current.

Animal experiments as well as anatomical, pathological, clinical, and therapeutical studies are against the ascending theory. Experiments show that infection of the genito-urinary cross-way never ascends to the kidney nor descends through the vas deferens to the testis. The seminal current reverses the conditions, but at puberty and during full sexual vigor, the most favorable for genito-urinary tuberculosis, there is a constant current of semen upward toward the cross-way, but this does not cause an ascending type, for it is in the direction of the physiological secretions of the parts. The prostate is rarely affected in children with tuberculous testis. The kidney infection is rarely secondary to the bladder, it being possible only when there is stagnation in the ureter due to constriction which may result from gonorrhea or secondary infections of the bladder. Careless examinations may cause ascent to the renal pelvis, hence in some cases it is preferable to use a urine separator instead of the ureteral catheter.

Kraemer,[9] based on his and others' work, gives the following pathology of genito-urinary tuberculosis:

1. A unilateral kidney tuberculosis is usually of hematogenous origin, this not being excluded even by a localization in the kidney pelvis. The tuberculosis extends to the ureter on the same side and to the bladder. It may not affect the ureter, but involve the prostate and indirectly the seminal vesicles and urethra. Direct extension to the other kidney or to the testis is impossible.

2. If the other kidney becomes tuberculous it is infected through the blood, if not congenital.

3. Unilateral tuberculosis of the testis is congenital or hematogenous; often from the peritoneum in childhood. It may be latent a long time. The disease may extend to the body of the testis or to the vas deferens of the affected side, to the seminal vesicles, the prostate, or even to the bladder and urethra. Extension by continuity to the second testis or to the kidney does not occur.

4. Tuberculosis of the second testis may occur as in the first, or it may extend from one to the other by the lymphatics.

5. Tuberculosis of the seminal vesicles, prostate, and bladder originates usually secondarily from kidney or testis and is possible without their involvement. It may be independently affected from congenital or hematogenous origin. The tuberculosis cannot go from here

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by the vas deferens to the testis, nor by the ureter to the kidney.

6. All combined forms of genito-urinary tuberculosis obey the same laws. The disease either existed in latent forms or the organ became infected during the disease course by hematogenous or lymphogenous routes, or if the organ lies down stream it was infected by the germs borne by the current. Congenital conditions may be great factors. Therapeutic results offer further proof of these statements.

The prognosis is usually grave if severe pulmonary or bone tuberculosis is present. If primary there is always a hereditary predisposition to the disease. Local as well as constitutional treatment is indicated. Severe genito-urinary tuberculosis affects the pulmonary form unfavorably. Traumatisms, inflammations, and gonorrhea act as predisposing causes, hence there is a wide and favorable field for prophylaxis. Gonorrhea in a tuberculous person should be carefully studied. Disappearance of the germs alone is not sufficient, but all postgonorrheal lesions should be removed. It is advisable to examine all tuberculous patients with any genito-urinary complaint thoroughly for tuberculosis of the genito-urinary organs. Rectal palpation, examination of the testicles, epididymii, and urine will often reveal unsuspected conditions. The cystoscope often shows an infected bladder and kidneys with slight clinical symptoms. The postoperative findings often show extensive destruction.

Treatment is most useful in the early stages. Infection when limited to a single organ has healed clinically. The connective tissue may retain virulent bacilli for a long time and have their activity renewed by an injury. Simmonds[15] found cerebral or meningeal tuberculosis in 19 of 60 autopsies in genito-urinary cases. In primary tuberculous genito-urinary cases, if the general condition is good, use general treatment. The use of instruments may lead to a secondary infection. Careful and constant attention is necessary, and if the infection extends even slightly, then forestall destructive effects by active or radical surgical measures, though these must be omitted if the process is far advanced. Even in these cases surgery may palliate the condition by draining large cavities of stagnant urine and preventing secondary infection. In posterior urethral infection not needing operation use the guaiacol compounds internally and locally, sublamin and iodoform emulsion instillations, mercury oxycyanate irrigations for pains and frequent urination. Continue these methods if hematuria and pyuria are helped. Cauterize isolated ulcers of mucous surfaces, but do not use irritants or astringents. Careful antisepsis is needed to guard against secondary infection. Saxtorph[3] states that surgery in vesical tuberculosis is only justified when the cause and manner of its secondary infection are clear and their deleterious effects can be removed. Renal infection of the bladder cystoscopically shows effect on ureteral papillæ. Israel[16] found the bladder diseased in 50 per cent of all operated cases of renal tuberculosis. The only treatment is nephrectomy, which presupposes that the other kidney is healthy. Removal of the kidney often leads to a recovery of the bladder under supporting general treatment. Some bladder cases will not heal even after removal of the primary focus, being already too far advanced, but after the nephrectomy we must treat the local condition. Sectio alta to permit thorough drainage and remove the diseased tissue gives the best results.

Bladder involvement is more difficult to relieve when the infection is from the genital organs, as destructive changes at the bladder neck are usually too extensive for surgery. In these cases the foci should be removed and the abscesses opened and cleaned. Suprapubic section gives access to the bladder and relieves

the painful urinary tenesmus. Operative measures must be frequently repeated, and will often lead to fistula.

Genito-urinary cross-way tuberculosis is usually secondary; the conditions for its development and spread are favorable, hence treatment is of little value. The genital foci should be eliminated before they reach this point.

Abscesses and fistulæ from Littre's or Cowper's glands require early incision, drainage, and curettement to get the best results. In renal tuberculosis a single isolated nodule in the prostate may heal after a nephrectomy. The seminal vesicles are never infected by a renal lesion. Large abscesses, or those threatening to perforate, and fistulæ must be slit. If the foci are numerous expose the prostate and remove, under the eye, all diseased tissue. Perineal fistulæ remain after almost all operations on tuberculous prostates and seminal vesicles. Timely extirpation of the diseased testis is analogous to nephrectomy in bladder tuberculosis. Castration is justified by the reports of many operators; it prevents further spread. Early conservative treatment is justified in cases with favorable nutrition, but if not followed by prompt improvement lose no time, for delay may mean suffering and chronic invalidism. Simmonds says if the disease is confined to the testis and epididymis, with intact seminal vesicles, absence of general genito-urinary tuberculosis and advanced pulmonary tuberculosis, then operate at once. Radical rather than partial operations give the best results.

Castration should be usually accompanied by resection of the vas deferens, as the latter is often involved, and it is impossible to tell to what extent. Before extirpating the seminal vesicles, especially in pulmonary cases, try intracanalicular injections of iodoform emulsion into the vas deferens. This may be useful in the late stages, for most invasions of the vas are intracanalicular. If the results are not good, then high castration with resection of the seminal vesicles should be done.

Tuberculous testes in children do not require radical interference, as they usually heal spontaneously or after slight operations.

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BOOK REVIEWS.

TEXT-BOOK OF PHYSIOLOGY. By William H. Howell, Ph.G., M.D., LL.D., Professor of Physiology in Johns Hopkins University. W. B. Saunders & Co., Philadelphia and London. Price $4.00.

Those who have given for some years attention to the reviewing of books notice two tendencies in text-book making. As a science expands the text-books increase in size. There is an addition of the new knowledge to the old until some one discovers that much of the old knowledge can be eliminated or re-stated without loss in the presentation of the subject. That so accomplished a physiologist as Dr. Howell can prepare a text-book on physiology for medical students and physicians and bring it within the compass of 905 octavo pages merits more than passing attention at the hands of the reviewer. As an example of knowledge which was once important, but which now seems to have fallen into innocuous desuetude, we might mention the "proximate principle" which formed such an important chapter in Dalton's Physiology of twenty-five years ago. The then teacher of physiology having a student before him who could not give all the proximate principles was wont to say that he did not know the rudiments of the subject. If he knew these he was safe to be sent out into the medical world, being fully apprised of the mysteries of normal chemistry. Howell's volume contains no reference to proximate principles as they were taught in our student days. To be sure he speaks of proteids, globulins, albuminates, nucleoalbumins, terms which were formerly unknown, to say nothing of the very late additions such as protamins and histons. In his preface he says some excellent things in reference to the genesis of text-books, placing first the necessity of simplicity and ludicity in the presentation of the subject, and secondly the judicious limitation of the material selected. He recognizes that any adequate explanation of the conflicting observations and varying theories in our present knowledge of the subject of physiology is out of the question unless they can all be stated and the reader allowed to make his choice. This means a book of enormous size, which would be suitable for specialists or advanced students. For the beginner the author must assume the responsibility of sifting the evidence, but he believes that the reduction in material should be made rather by a process of elimination than by condensation. The latter method is suitable for the specialist with his background of knowledge and experience, but it is unfitted for the elementary student. It is the art of presentation more than anything else that makes a text-book successful, and in the present state of physiological knowledge and in the present state of physiology, this department offers peculiar difficulties to the text-book writer.

In our student days the nervous and reproductive systems were relegated to the latter part of the book, while the foundation stone, the proximate principle, was considered at the beginning. The topics are now reversed, and in the current volume section one is devoted to the physiology of muscle and nerve, followed by the section on the physiology of the central nervous system, and then the special senses. Later the blood and lymph, the circulation, respiration, digestion and secretion, and nutrition and heat production and regulation are considered. The last section is devoted to the physiology of reproduction. We cannot discuss the separate chapters. All we can say is that in our judgment the writer has produced one of the most attractive works on physiology that has appeared for a good many years. Notwithstanding the comparatively small size of the work the writer has produced a most attractive treatise characterized by lucidity and succinctness in presentation, together with a judicious selection of the material to be used. The student must study his physiology, and the practitioner may. We would earnestly urge those who have not recently read a work on physiology to do so. The man who thinks that his knowledge of the primary subjects of medicine was completed in his student days, particularly his physiology, would be broadened by the reading of a text-book like Howell's. It is the getting away from the elementary principles of the medical science that does so much to narrow the man of advancing years.

FOOD AND DIET IN HEALTH AND DISEASE. By Robert F. Williams, M.A., M.D. Lea Bros. & Co., Philadelphia and New York, 1906.

The writer has produced a compact manual of dietetics, setting forth its principles and endeavoring to give in a concise and intelligent manner directions as to the use of food in health and disease. Technicalities have been avoided that the work may be intelligible to persons without technical training. In grouping foods the writer has departed from the time-honored practice of dividing them into animal and vegetable products, class-

ifying them according to their practical uses in the body. The work incorporates the observations made at the experiment stations of the United States Department of Agriculture. The work opens with a discussion of the elementary constituents of the body and an analysis of various foods. An unusually clear account is given of the caloric value of food as a means of estimating the value of different foodstuffs. The error of relying too closely upon chemical composition of food is clearly stated in discussing vegetable proteids, of which only 84 per cent is absorbed and becomes available in the nutrition of the body, while from animal foods 95 per cent of the proteids can be used. There is a brief chapter on the digestive processes, and one on cooking as a means of preparing food. Eggs are said to be one of the best of foods, as they contain all that is necessary for maintaining the tissues of the body. In discussing the digestibility of eggs it is stated that the method of cooking does not materially alter their food value, but does affect the time in which digestion takes place. The reputed indigestibility of hard-boiled eggs is said to be due to the fact that the white is not thoroughly masticated. The yolk is digested in about the same period of time whether raw, soft-boiled, or hard-boiled. The common idiosyncrasy relating to eggs is referred to. The chapter on milk as a food deals adequately with milk as a diet and with the various milk products.

In discussing the cereal breakfast foods, which have been facetiously termed "near" food, the writer says that most of them are made from wheat and oats, though some are prepared from rice, corn, or barley; while their nutritive value is practically identical, the prices vary greatly. The most of them have the outer covering or husk of the grain removed, and the remainder of the seed ground, rolled, or crushed. Some of them are first partially cooked, usually by steaming; a few are parched; many of them are said to require little cooking, but most should be cooked for at least half an hour in order to prepare them for digestion. The cereal foods are said to be of value, though that they are more nutritious than flour is fallacious. Flour furnishes the greatest amount of proteid at the least cost. The humble peanut contains 52 per cent of proteid and 39 per cent of fat, showing it to have a high nutrient value. It is easily grown and is abundant and cheap, and a few efforts have been made to bring it into more extended vogue as a food for man. These have not been very successful, and in the South, where it has been grown abundantly for years, it has never become a staple article of diet.

The discussion of the quantity of food, frequency of feeding in relation to exercise, sleep, in the different periods of life, contains simple, plain directions which can be readily applied. In discussing the use of milk in the acute infectious diseases, particularly typhoid, the writer deprecates its routine administration regardless of idiosyncrasy. He points out what is so often forgotten, namely, that milk while administered as a fluid coagulates in the stomach in large, firm curds. When digestion is feeble these curds often pass through the digestive tract unaltered. In this way milk may act as a mechanical irritant to the inflamed ulcerated intestines. When milk is administered in typhoid fever the stools should be carefully watched, and if curds appear milk should be withheld, reduced, or modified. Eggs are spoken of as a complete food very useful in the typhoid dietary. In discussing the diet in disease generally the writer shows a common-sense tendency which is very refreshing in these days, when too much reliance is placed upon the test-tube and chemical composition and too little upon individual variability.

Clinical Obstetrics. By Robert Jardine, M.D. Edin. Second Edition. Rebman Company, New York, 1905. Price $4.75.

The author is professor of midwifery in St. Mungo's College, Glasgow, and is senior physician to the Glasgow Maternity Hospital. The work is dedicated to those obstetricians who are endeavoring by aseptic methods to do for midwifery what has already been done for surgery. In the preface to the first edition the writer refers to the unsatisfactory instruction in midwifery afforded undergraduates, the bulk of the instruction being systematic, with attendance on a few labors. Special stress is laid upon the subject of cardiac complications of labor and eclampsia. In this edition the writer gives a history of thirty cases. In discussing eclampsia the writer says that the kidney of pregnancy results from the toxic action of the products of metabolism on the kidney substance. The toxin resembles turpentine or cantharidin in its action on the kidney. The urine, diminished in amount, is loaded with albumin and sometimes contains blood. The liver is affected, but whether prior to the kidneys he cannot say. In some cases it appears like an early stage of yellow atrophy, while hemorrhages under its capsule or into its substance are quite common. Reproduction of a water-colored drawing of the liver from a case of eclampsia is given which accurately shows these changes. The toxin also acts upon the fetus. It is often killed and sometimes has convulsions *in utero*, or they may occur a few days after birth. The urine of the fetus contains albumin. In treating eclampsia the writer's experience favors saline infusion, which has given better results than any other method. Full-blooded patients with strong, bounding pulse are bled. From 15 to 20 ounces of blood are drawn from a vein in the arm, and the saline fluid is then injected into the veins. When there is much restlessness chloral and bromide

are given, and chloroform for the convulsions. Morphine has been given up entirely. The obstetric management of eclampsia is based on the indications in the individual case.

The work is well issued by the publishers and is fully illustrated.

OPERATIVE SURGERY. By John J. McGrath. Second Edition. The F. A. Davis Co., Philadelphia, Pa., 1905. Price $4.50.

The first edition of this work was a well-directed effort to combine in a practical way the subjects of surgical anatomy and operative surgery. In its second edition there has been a careful revision, and many subjects have been more fully treated, including the surgery of the prostate, pancreas, spleen, stomach, and intestines. It is impossible in the space at our disposal to elaborately review a work of 628 pages in which hundreds of operations are described. All that can be done is to refer to the general arrangement and manner in which the author deals with the subject. It is not a mere catalogue of operations, though various methods are described. The descriptions are so grouped that an intelligent conception of the operations is obtained, and the various procedures are articulated by the anatomical details. The descriptions are clear and accurate, and sufficiently full to be used as a guide in performing operations. There are no serious omissions, though the scopolamine-morphine method of anesthesia is not mentioned. The omission is not important, as this method of anesthesia will soon fall into disuse, though it will ultimately be revived as a method which will meet the indications in a few exceptional cases.

DEVELOPMENTAL PATHOLOGY. By E. S. Talbot, D.D.S., M.D., Chicago, 1904.

This is a collection of the studies of Dr. Talbot in developmental pathology, especially as related to stomatology. Developmental pathology, according to Dr. Talbot, is the domain of pathology which deals with departures of structures and organs from the normal along the line of arrests of fetal development, either in structure or biochemic states underlying function or potentiality of development at given periods of growth. Structures undergoing arrests or degenerations are, because of lessened blood-supply, more liable to disease than structures which are evolving higher. There are two sections of the book, one on developmental pathology and the other on developmental pathology of the alveolar process. The studies are of much interest to general medicine, as the principles outlined are as applicable there as in stomatology. They merit perusal by the practitioner.

PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of Gustavus P. Head. Vol. IX, Edited by W. A. Evans, Adolph Gehrmann, and William Healy. Series 1905.

The current volume opens with a brief reference to the anatomical progress of the past year, contributed by Evans. This is followed by a description of physiology, and then a more extended discussion of pathology, which makes up the major portion of the work. There is a short account of bacteriology. It is significant of the growing nomenclature of medicine that Healy can find 370 new words gathered from the literature of the year that need definition. A science that is inventing a new word every day is certainly progressing so far as its nomenclature is concerned.

PHYSICAL DIAGNOSIS. By Egbert Le Fevre, M.D. Second Edition. Lea Brothers & Co., Philadelphia and New York, 1905.

The author has produced a compact and satisfactory manual of physical diagnosis. He has brought it within the compass of 479 pages, and yet has presented the main features of the physical signs to be elicited in the diagnosis of thoracic and abdominal disease in a satisfactory manner. The work has been prepared by a practical teacher, the plan followed being based upon the author's own experience in the instruction of undergraduates. Especial emphasis is laid on altered anatomy of the organs and its relation to the physical signs. The work is well illustrated and handsomely printed, and is of a size that adapts it to hospital and classroom instruction.

ABSTRACTS.

THERAPEUTICS.

Spastic Constipation.—

STUNN. *St. Paul Medical Journal,* vol. viii, No. 1, p. 21, January, 1906.

Cases of constipation can be divided into two groups, the atonic and the spastic. The atonic is the most usual form and is not accompanied by pain. In the spastic type, which is rarer, there is usually pain, which may be located in any part of the abdomen, but usually somewhere along the course of the colon. As a rule the pain bears no relation to the ingestion of food. The pain varies in severity and duration; it may be sharp and lancinating, or dull, heavy, and cramping. In patients with thin abdominal walls it is sometimes possible to detect the contracted segment of the intestine with the fingers. If the finger is introduced into the rectum the spasm can be felt. The most light is thrown on these cases by the character of the stools, which are often cylindrical, two to four inches in length, with a diameter of a quarter of an inch. Sometimes they have a triangular shape, or again are ribbon-like masses. Stringy mucus not infrequently accompanies the passage.

In treating these cases it should be borne in mind that there is an irritative condition in the large intestine, and that the ordinary methods used in atonic constipation will only aggravate the trouble. Such patients have usually tried the ordinary cathartics and have found them of no service. A diet rich in cellulose and producing an abundant digestive residue such as would be useful in the atonic form of constipation is harmful in these cases. Fruit may be allowed, but it would better be cooked than raw. Exercise is often objectionable in these cases, some patients being improved by rest. Warm baths and hot applications to the abdomen are beneficial in relaxing the spasm. Cathartics in all these cases must be avoided. Belladonna or opium act well in relieving the spasm, but the best therapeutic results are secured through the injection of olive or cottonseed oil. This is used every evening at first, later every second evening, and finally once or twice a week. The oil lubricates the intestines, softens the intestinal contents, and splits up the fatty acids. The last action probably causes an increased peristalsis through chemical excitability. The oil should be given just before going to bed and retained until morning. A pint can usually be used. It is best given with the patient lying on the right side, the left limb extended and the right flexed at the knee and placed in front and over the extended left one. A moderate-sized rectal tube passed seven or eight inches into the rectum will allow a pint of oil to be injected. It should be given at a temperature of 100° F., and after the injection the patient should remain quiet. Electricity, massage, severe exercise, cold baths, and other measures which are useful in atonic constipation should be avoided in these cases.

Inhibitory and Anesthetic Properties of Magnesium Salts.—

MELTZER, S. J. *Medical Record,* vol. lxviii, No. 25, p. 965, Dec. 16, 1905.

Of the four main inorganic constituents of the animal body—sodium, potassium, calcium, and magnesium—the effects upon nerve and muscle of only the first three have been very carefully studied, those of magnesium for some reason having hardly been considered at all. In studying the action of various substances injected into the brain Meltzer found that mag-

nesium produced paralysis rather than convulsions. Pursuing this lead, he found that this element with its salts invariably caused depression or inhibition of nervous and muscular action. In a few seconds after the injection of a small dose of the sulphate or the chloride of magnesium respiration ceased, and the animal would die without the struggle of asphyxia and without any sign of sensation unless artificial respiration was practiced for a long time. When injected rapidly, 0.1 of magnesium sulphate is profoundly toxic, but as much as 1.5 of the salt, if injected slowly in the course of an hour, will occasion no untoward symptoms. Herein is the probable explanation of the fact that Epsom salt, when taken in the ordinary way, produces no poisonous symptoms; some absorption doubtless occurs, but it occurs so slowly as to be harmless. In another series of experiments it was ascertained that solutions of magnesium salts applied directly to a nerve trunk caused a complete block, abolishing conduction entirely. In a third series it was found that by means of subcutaneous injection of magnesium salts complete general anesthesia, with perfect relaxation of the muscles, but without impairment of the vital reflexes, was produced. In a fourth series of experiments the magnesium salts were injected into the subarachnoid space of the spinal cord, mostly by lumbar puncture.

Monkeys were the animals experimented upon. The injection of magnesium sulphate in a dose of about 0.06 per kilo of the animal's weight caused within a minute or two complete anesthesia and paralysis of the tail and hind legs. This discovery has been put to practical use in twelve operations performed under the influence of intraspinal injection of magnesium sulphate. The highest dose employed was 0.2 per kilo, or 15 drops of a 25-per-cent solution for each 20 pounds of body weight. In the first eight cases some chloroform was used to supplement the effect, as the tentative doses of the salt were very small, but in the last four the magnesium alone sufficed. The best time for operating was found to be three or four hours after the spinal injection. As a precautionary measure the author insists that the Fell-O'Dwyer apparatus for artificial respiration be on hand whenever this magnesium anesthesia is employed. Finally Meltzer reports the cure of a case of tetanus at Roosevelt Hospital. After the employment of 115 Cc. of tetanus antitoxin without effect, the first injection of a solution of magnesium sulphate afforded great relief for thirty-six hours, and after a few more injections the patient was pronounced cured.

The Curative Treatment of Pneumonia, with Points on Hydrotherapy and Therapeutic Fasting in Fevers.—

PAGE, C. E. *Medical Record,* vol. lxviii, No. 26, p. 1009, Dec. 23, 1905.

The writer enters a strong protest against what he terms the non-curative, not to say killing, treatment of pneumonia, which is the prevailing one, and includes drugs and forced feeding plus the mischievous effects of hot poultices on hot lungs. The essential features of his own plan consist in the use of cool applications to the chest and abstinence from practically all nourishment except water. In this way the disease when taken early is frequently aborted, and the normal death-rate becomes five per cent for private and hospital cases combined, while in private practice alone it is about two per cent. For pneumonia the procedure recommended is as follows: A large towel, coarse linen or cotton, is folded lengthwise in the middle, then folded crosswise in the middle, and one-half the length of this four-ply towel is wrung tightly from ice-water, or the coldest water obtainable, and again folded crosswise, so as to give four thicknesses of damp towel next the skin, and the same, dry,

outside. The damp folds should be freshened as often as they become at all hot, whether this be in ten, twenty, or thirty minutes. At first, in severe cases, the changes will be as often as every eight or ten minutes, the intervals lengthening more and more as the inflammation subsides, and breathing consequently becomes deeper and easier. When the patient is able to breathe naturally, and the compress no longer becomes hot, and before it is felt to be an uncomfortable treatment, this local cooling should cease. In some cases hot applications are also made to the legs. The author emphasizes the untoward results attending the employment of forced feeding, and points out the great advantages of keeping the patient on a diet of warm water until convalescence is established. The mortality from typhoid fever has shown no improvement during the past seventy-eight years according to the records of the Massachusetts General Hospital, and the author attributes the bad results largely to the overfeeding practiced.

Opium in Hypertrophy of the Pylorus in Infants.—

NEILD. *Lancet,* clxix, No. 22 of vol. ii, p. 1543, Nov. 25, 1905.

Two cured cases of hypertrophy of the pylorus in infants do not justify the claim that opium is a specific in the disease, though they justify the use of this drug in spasm with hypertrophy, and no case should be subjected to operation until opium has been tried. A breast-fed baby aged five weeks had been vomiting since birth and constantly losing flesh. There was constipation with occasional attacks of diarrhea. A few small contractions of the stomach could be made out, although the pylorus could not be felt. Three days later the child was seen immediately after having been fed, and after a few minutes there were plainly visible the characteristic gastric waves and the pylorus was distinctly palpable. One minim of the tincture of opium was added to ten ounces of water, of which the child was given a teaspoonful twenty minutes before each feeding. Under this treatment there was marked improvement and a gain in flesh. The vomiting lessened in frequency and then came on only twice a day. At the end of three weeks the opium was stopped, but the vomiting returned. The opium was again administered, after which there was a perfect recovery.

Another typical case occurred in a patient aged eight weeks who had been bottle-fed from birth. At the end of the first week the vomiting was noticed. There was great emaciation, the gastric wave was strong, and the pylorus was plainly palpable. No change was made in the diet. One-eightieth of a minim of tincture of opium was ordered, which was later increased to one-fourth, followed by improvement in the appearance and vomiting.

Fresh Air and Rest in the Treatment of Pulmonary Tuberculosis.—

POGUE, G. R. *Medical Record,* vol. lxviii, No. 24, p. 931, Dec. 9, 1905.

Harm is done consumptives by the indiscriminate prescribing of fresh air, outdoor life, and exercise, without proper instructions and education of the patient, together with a consideration of the extent of the lesions present. It is folly to place a patient with high fever, chills, and sweats outdoors all day long in cold weather, and then require him to sleep in an open tent with no provision made for the comforts of life to which he has been accustomed. On the other hand, the patient in the early stages of the disease who is told to adopt tent life, without being given definite instructions, is very apt to shut himself up tight at night in his tent, and so spends seven or eight hours a day in a closed canvas box. Patients must be kept outdoors all day long in the open air, and practically the same conditions must prevail at night, but they must be made comfortable, and be protected from cold winds,

rains, and storms, and during the summer months from the direct rays of the sun. The beginning of the outdoor life must be made gradual, without abrupt transition from the patient's usual mode of life. Similar fallacies exist in the minds of the laity, and even of the profession also, regarding the value of exercise. The patient who is told to live out-of-doors and "rough it" usually does not live long to carry out the injunction. Of sixty-two patients in various stages of the disease, whose histories are known to the author, who during the last five years have taken the "roughing it" cure, forty-three are dead and only two show signs of having their disease arrested. Rest is the element it is important to secure, for usually the patient is only too apt of his own accord to take too much active exercise.

Antiseptic Action of Bromine.—

STROUD, H. E. *Surgery, Gynecology and Obstetrics,* vol. i, No. 6, p. 530, December, 1905.

The writer regards bromine as an antiseptic of the highest order, and as of very great value in the treatment of septic wounds. In using the bromine in this way it is prepared by taking bromine 2 drachms, bromide of potassium 2 drachms, and 1 pint of water. These are mixed and kept in a glass-stoppered bottle. The part to be treated is cleaned as well as possible and wrapped in a single thickness of plain gauze, and over this is applied a thick layer of absorbent cotton. Into a glass jar are put from six to twenty gauze sponges of ordinary size, and over these is poured as much of the bromine solution as they will pick up, squeezing out the excess. The glass jar must be closely stoppered. With a pair of forceps the pledgets are laid on the cotton and are covered with another thick layer of the same material, and as soon as possible the whole part is covered with oiled silk and loosely bandaged. In this way the fumes of the bromine but not the solution are brought in contact with the diseased part. This dressing may be renewed in from six to twenty-four hours. In very severe infections the writer uses a few drops of the solution as an injection into sinuses, but ordinarily it is reduced from one to ten with the water. This solution is a powerful germicide and may be used in a great variety of conditions, notably offensive leg ulcers, in which nothing will be found equal to bromine in clearing them up.

Water as a Local Anesthetic.—

WYETH, J. A. *New York Medical Journal,* vol. lxxxiii, No. 1, p. 29, Jan. 6, 1906.

When Schleich's infiltration method of anesthesia with weak solutions of cocaine first came into use the writer became convinced that the loss of sensation was due more to the distention of the tissues with water than to the cocaine. In the latter part of 1905 the writer removed an epithelioma from the back of a physician under water anesthesia. A small-sized hypodermic needle was used, which was inserted in the proposed line of incision, the point remaining in the substance of and not beneath the skin. About ten minims of water was forced into the skin, which assumed a death-like pallor. The needle was introduced along the proposed line of incision and various places completely anesthetized. The skin incision was then made without causing the slightest pain. The needle was then thrust between the capsule of the tumor on the subcutaneous areolar tissue, and water was freely injected so as to lift the skin from the tumor, after which the needle was inserted between the base of the tumor and the underlying connective tissue. These injections cut off the nerve supply in the area of dissection. The patient stated that at no time during the operation or during the insertion of the sutures was any pain felt. S. G. Gant has used the same method of water anesthesia extensively in rectal operations.

Vomiting of Pregnancy.—

ROSEWATER, C. *Journal of the American Medical Association,* vol. xlvi, No. 2, p. 101, Jan. 13, 1906.

In moderate cases of the vomiting of pregnancy, when no local disease or malposition can be found, the writer advises the patient to stay in bed at least an hour after breakfast, and prescribes ingluvin, ten grains before and after each meal. This, or similar treatment, is usually all that is required in the milder cases of hyperemesis gravidarum. In the severer forms there is usually, but not always, some pathologic condition to be found, which if rectified will be followed by relief of the symptom. He criticizes the use of extreme measures carried beyond the absolute necessity of the case and tending to produce abortion. He reports a case in which he was able to check the vomiting which was threatening the patient's life, by introducing a bougie into the uterus and leaving it there forty-eight hours until the vomiting ceased, without interrupting the pregnancy, which went on favorably to term. The point he wishes especially to emphasize is that "when in pregnancy, for just and lawful reasons, the emptying of the uterus is resorted to, and during the operation improvement in the fundamental conditions supplying the excuse for the abortion occurs, it is the duty of the physician, if not too late, to cease in his attempt to cause abortion, and to make all efforts to save the child as well as the mother."

What is a Poison?—

ECCLES, R. G. *American Medicine,* vol. x, No. 25, p. 1037, Dec. 16, 1905.

In discussing poisons the writer says that no substances are poisons *per se;* that the idea that minute amounts of poisons are injurious is an error; that different organisms respond differently to different poisons; and that the quality of poisonousness is, for each particular organism, a function of dose. To know whether it is proper to consider any substance as a poison it is necessary to know the animal or plant to which it is to be administered, and the dose in which it is to be given. Under sufficient dilution, so that a large dose cannot be administered, neither strychnine, arsenic, nor other toxic body can reasonably be considered poisons. Prussic acid, as present in fruit, is as harmless as water, and all so-called poisons, under sufficient dilutions, become absolutely innocuous. It has been experimentally shown that toxic substances, at certain definite dilutions, are not merely innocuous, but that they are positively beneficial. As protoplasm is indifferent to slight warmth, stimulated into greater health and vigor by increased warmth, but killed by excessive heat, so also it behaves to poisons in a somewhat similar manner.

Diet in Nephritis.—

SHATTUCK, F. C. *Journal of the American Medical Association,* vol. xlvi, No. 1, p. 1, Jan. 6, 1906.

Such control as we may have to-day of nephritis lies in diet and mode of life rather than in drugs. Such drugs as are useful are so in their effect on the general organism and the heart rather than on the kidneys directly. In all cases of nephritis the main aim is to spare the kidneys unnecessary work, remembering that the urinary system is but one of the many making up the body. In acute nephritis, as well as in the acute exacerbations of the chronic forms, Doctors, Diet, and Quiet should work together. Starvation for a few days, regulated by the intensity of the process and the strength of the patient, is the key-note here. In the chronic forms the aim is to lighten and to lengthen life. Especially in the contracted form of kidney disease, many years of life and comfort may depend on the physician's skill in adapting sound principles to the particular case and in securing the coöperation of the patient in persistently carrying out the directions given. Dietary restriction should,

in the main, be quantitative rather than qualitative. Alcohol in moderation is not necessarily a poison and may be an aid to digestion. The excess of proteid, not proteid itself, is harmful to the chronically sick kidney. A varied diet is more likely than a monotonous one to promote the making of good blood and improving the general nutrition, and that of the myocardium in particular. The amount of albumin is in itself no guide as to the extent of dietary restriction. A relatively dry diet should be recommended in dropsical cases, proportioned to the degree of dropsy. In cases of contracted kidney, even without dropsy, physicians have erred in forcing water, and the main service von Noorden has rendered is in advocating the limitation of liquids.

THERAPEUTIC BREVITIES.

Lumbar Puncture in Fractures of the Base of the Skull.—

On the whole lumbar puncture has not sustained the early enthusiastic claims made for this procedure. In acute meningeal affections the evidence of its value is very conflicting, while its positive harmful effects in certain cases of increased cranial pressure have been abundantly shown. In cases of cerebral tumor in which intracranial pressure is high the sudden lowering of pressure in the spinal canal may drive the medulla and cerebellum deep into the posterior fossa of the skull and the upper portion of the cerebral canal in such a way as to produce instantaneous death. That it is a procedure not to be lightly undertaken, but may be be of very great use from a diagnostic and possibly from a therapeutic standpoint, is true, but its dangers should be fully recognized. Quénu (*Bull. de la Société de Chirurgie*) describes seven cases of fracture of the base in which lumbar puncture was resorted to with success. The prognosis in fracture of the base has been greatly improved by modern antiseptic surgical methods. It is claimed by Quénu that the results in his cases were due to the lowering of intracranial pressure. In one case in which lumbar puncture was performed seven times, before each operation the patient was comatose, the relief of pressure being followed by a return of consciousness. It is claimed in these cases that there is an increase in intracranial pressure due to an increase in the cerebrospinal fluid, and also due to effused blood. The possibility that it may act as an irritant to the nervous tissues is also to be considered.

Mica as a Surgical Dressing.—

We recently abstracted an article by Aymard advocating glass as a dressing for granulating wounds. In a letter Todd-White (*Lancet,* Dec. 17, 1905) calls attention to the value of mica for the purpose of making a window for the inspection of a damaged area. Aymard advocated glass, as it was a painless dressing, easily removed, and had a tendency to keep down redundant granulations. For this purpose White claims that mica is more convenient, as it is less clumsy than glass, and can be fastened over the wound with strapping. It does not break or crack, and the bandaging can be simpler; hence the dressing is cooler and more comfortable. Like glass it enables inspection of the wound to be made without disturbing the dressings, which is a comfort to the patient and a convenience to the surgeon, who can leave the first and only dressing on until the wound is healed, there being no necessity for removing it to ascertain how things are getting on. He has experimented with various chemicals and antiseptic solutions and has ascertained that they have no action upon mica. In using the mica he applies three or four layers of gauze or lint with a hole cut in them corresponding to the wound. Over this a mica plate is placed, and the whole is fastened

with adhesive plasters. Such a dressing cannot be used where there is much discharge, but they are possible in a considerable number of cases.

Opium in Myocarditis, Weak Heart, and Dilated Heart.—

J. H. Musser (*American Journal of the Medical Sciences,* January, 1906) says that opium is a tonic in cardiac debility. The flagging heart of shock induced by pain or other depressive measures can be brought up by morphine. The drug is also valuable in the heart failure of myocarditis. Opium or morphine can be given to prevent angina pectoris, and thus defer the dreaded asystole. Patients may be given for months small doses of deodorized tincture of opium, which will reduce waste, lessen the peripheral sensations which fret an irritable heart, calm the nervous system, and lessen the necessity for food, with a corresponding improvement of digestion, metabolism, and elimination. In cases of weak heart, after exhausting disease following prolonged mental and physical pain and without organic lesion of the valves or of the muscles, opium is of advantage. It may be useful in failing compensation when the patient is irritable and nervous. The dyspnea of myocarditis is relieved or prevented by continued small doses of morphine for a long time.

Isoform in Skin Diseases.—

This substance is a para-iodo-anisol, and it is claimed that it is a powerful antiseptic, not, however, due to its iodine content. It is said to be unirritating and non-poisonous. The powder in its pure state is explosive, has a pleasant odor, and is not prepared pure on account of its detonative tendencies. Mixed with equal parts of phosphate of calcium it is free from danger. It has been found useful in subcutaneous infections, sinuses, and venereal ulcers. When applied to an ulcer there is a slight burning sensation which lasts for a short time. The ulcer rapidly cleans, cicatrizing more rapidly than when the ordinary antiseptics are used. The substance is not unirritating, and the use of isoform gauze has produced dermatitis. Various parasitic diseases of the skin have been markedly improved, and two or three applications have cleared up cases of pityriasis versicolor. It has also been found useful in cases of acute gonorrhea.

Sterilization of Catgut.—

W. H. Watters (*Medical Record,* Jan. 6, 1906) refers to the difficulties attending the sterilization of catgut by the usual method. He highly commends a method devised by W. F. Wesselhoeft. The separate strands of catgut are placed in a small envelope, which is enclosed in a larger one. The envelopes are dried and placed in a small brass case which is partly filled with alcohol. The case is then securely closed by screws and immersed in boiling water for an hour. This raises the temperature of the contents to 212° F. and develops a pressure of 25 pounds to the square inch, insuring thorough impregnation of the catgut with the alcohol. The envelopes dry in a short time on removal from the alcohol. The advantages of the method are its simplicity and cheapness. Practical experience and culture experiments show that by this method the catgut is efficiently sterilized.

Methylene Blue in the Treatment of Noma.—

Methylene blue will penetrate deeply into tissues as it does not coagulate albumin. It is an antiseptic and exercises an efficient control over many suppurative processes. The pathology and etiology of noma are obscure, and probably dependent upon a variety of infections. It is a most intractable affection, and when the process has involved the entire thickness of the cheek a fatal ending is to be expected. Alvany (*Reale Accad. di Med.,*

March 11, 1905) reports the treatment of three cases of noma, one of which resulted fatally. Two recovered, though they were in an advanced stage of the disease. In one of the cases which recovered the disease had perforated the cheek, and there was involvement of the alveolar processes, with pronounced general intoxication. The application of methylene blue rapidly improved the symptoms.

Tampons in Chronic Constipation.—

J. A. Macmillan (*Medical Record,* Dec. 16, 1905) recommends rectal tampons in atonic constipation. The tampon is made of absorbent cotton, cheese-cloth, or lamb's wool, and should be sufficiently large to cause some distention of the bowel. It can be inserted through an ordinary proctoscope and packed into place by means of a long forceps. The best results are obtained when it is placed at the rectosigmoidal junction. The tampon is provided with a piece of string to facilitate withdrawal at the end of from two to six hours. At first the tampon is used every other day, and the interval between treatments is gradually lengthened as improvement follows. The author ascribes the value of the measure to the distention of the intestine caused by it. He has been successful in most cases in which he has tried it, though a few failures are noted. In a large proportion of cases enemata and cathartics may be discontinued from the first, and regularity in the passage of normal stools soon begins to be reinstated.

Static Electricity.—

M. C. Rice (*Medical Record,* Dec. 16, 1905) says that static electricity is not a cure-all, but is a valuable adjunct to other methods of treatment. The positive breeze is especially useful for relieving congestion, if the positive pole is used, whereas the results are less good if the negative pole is employed. A common mistake in electrotherapeutics is not to allow sufficient time for the treatment. Less than twenty minutes is not enough, and usually one-half hour is better. Headaches, epilepsy, neurasthenia, hysteria, are all benefited by the breeze, which is a sedative, while the static spark is a stimulant. Sparks produce counter-irritation and are useful in breaking up adhesions, will abort acute rheumatism, rupture ganglia, etc. Convalescence after operations or prolonged illnesses, tuberculosis, neuritis, tic-douloureux, and constipation are other conditions for which the author recommends the use of static electricity in one form or another.

Sodium Citrate as a Digestant.—

The Paris correspondent of the *Lancet* of December 9, 1905, refers to the recent communication of Variot, who draws attention to the value of sodium citrate in digestive disturbances. It has been highly recommended in the dyspepsia of infants, but is also valuable in that of adults. The action of the salt in preventing vomiting is very marked. If it is added to cow's milk coagulation is modified. It does not precipitate the lime salts of the milk, but increases their solubility. Citrate of sodium is superior to bicarbonate of sodium in digestive disturbances, and it does not cause a secondary secretion of acid in the stomach. It is especially useful in the dyspepsias of adults.

Dietetic Treatment of Gout.—

Von Noorden and Schliep (*Berliner klin. Woch.,* Oct. 9, 1905) have in some experimental work thrown light on the origin of gouty attacks. The production of uric acid in normal persons has been carefully studied, and then they have given 400 grammes of meat. The purin bodies from such a quantity in a normal individual are increased in the urine and ordinarily eliminated by the second day, though in some cases elimination may not be complete until the third or fourth day. In the

gouty the elimination is spread over a long period, and is far less complete than in normal individuals. In this way they have determined the eliminative capacity of gouty patients and can estimate the amount of meat or purin-forming bodies that they can safely take and avoid an attack.

The Value of Radium.—

M. Metzenbaum (*Medical Record,* Jan. 6, 1906) says that radium is to be classed with the Finsen light, *x*-rays, and surgery in the treatment of lupus, and with surgery and *x*-rays in the treatment of rodent ulcer and small epitheliomata. Large epitheliomatous areas and deep-seated malignant growths are less favorably affected. Inexpensive tubes of low activity are as efficient as the more costly ones of high activity.

MEDICINE.

Gastric and Duodenal Ulcer.—

BUCKINGHAM, E. M. *Boston Medical and Surgical Journal,* vol. cliii, No. 23, p. 635, Dec. 7, 1905.

The term peptic ulcer may cover both gastric and duodenal ulcer, the distinction between which is not important unless surgical intervention is undertaken. It has been asserted that non-operative treatment is unsatisfactory, but it is generally true that it is carried out in a half-hearted way. It is difficult to say what constitutes a recovery in these cases, as it is possible to have new ulcers form or paroxysms of symptoms in one ulcer with long intervals between. A series of cases is described by the writer which shows the importance of continued treatment after apparent convalescence. An interesting case of ulcer of the duodenum is described occurring in a boy five years old. It was the first known case of this disease admitted to the Children's Hospital of Boston occurring in a child. Previous to admission the health had been good. There was a sudden onset with abdominal pain, nausea, and diarrhea. There were twenty or thirty dejections on the first day, mostly of mucus and blood. The boy was well developed and nourished, but thirsty, restless, and apathetic. The abdomen was lax and apparently tender in the lower quadrants. Later the dejections became a brighter red, and an effort was made to relieve the hemorrhage by the administration of adrenalin and gelatin. On the eighth day the child died with a sudden hemorrhage.

Hour-glass stomachs, adhesions, and perforated pyloric orifices with their results must be treated surgically. With ulcers of which the symptoms are pain, vomiting, and hemorrhage, the indications are not so plain. Non-operative treatment sometimes succeeds and operation occasionally fails. Ulcers having the last set of symptoms should be considered in a separate class. At first sight the idea of excision appeals by its simplicity, but there are technical difficulties. Excision does not guarantee against hemorrhage; after the ulcer has been removed a fatal oozing may continue. This was noted in one of the writer's cases, in which three days after excision there was a large bloody dejection which was soon followed by death. At the autopsy no cause was found for hemorrhage. The stitches were tight and no other ulcer existed. Aside from excision the only possible treatment resolves itself into some way of keeping the ulcer quiet, which is sought to be accomplished by a gastroenterostomy, but this cannot always be relied upon to prevent peristalsis. But this operation is not to be counted on as giving any certainty of relief. Rest can be secured by putting the patient to bed and resorting to rectal feeding. This is the old method, and in some cases it is of more value than others. Some patients will not submit very long to the treatment, but the writer emphasizes the fact that unless all details

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of treatment are carried out the so-called medical treatment of gastric ulcer has not been employed. A patient who is allowed to suck ice or to get up is not undergoing the rest treatment. Whatever treatment is adopted its continuance should include a broad margin of safety. This is too often neglected. The nutrition of the patient should be maintained at the highest possible point, and it is possible with care to train the rectum so as to tolerate the enemas.

The Pathology of the Kidney.—

COUNCILMAN, W. T. *Journal of the American Medical Association,* vol. xlvi, No. 2, p. 81, Jan. 13, 1906.

The writer explains the complex structure and circulation of the kidney, its excessive blood-supply, its marked capacity for repair with slight capacity for complete regeneration of tissue, and the steady impairment of its structure with advancing age, due not only to arterial disease and wearing out, but also to the cumulative effect of slight lesions with constantly increasing inability to repair. The most easily understood kidney lesions are focal ones from bacterial invasion, either by way of the blood or through the urinary tract. Chronic congestion and urinary obstruction may also cause damage through pressure and interference with the circulation. How the damage constantly accompanying diffuse arteriosclerosis is produced is not known. The changes consist in destruction and degeneration of the parenchyma and increase of interstitial tissue, the latter being now generally accepted as secondary to the former. There is no evidence of an independent increase of connective tissue in arteriosclerosis. It is probable that the condition in the kidneys is the result of many factors rather than of any one. The greatest difficulty in understanding the pathology of the kidney is found in the acute, subacute, and chronic diffuse lesions not connected with changes in the flow of blood or urine, nor with the immediate action of bacteria. Among these are noticed the acute interstitial non-suppurative nephritis due to the deposition and proliferation in the renal interstitial tissue of lymphoid cells from the bone-marrow, spleen, etc., which occurs in acute infectious diseases, notably in the acute exanthemata. Why these cells accumulate in the renal veins is not known.

Epithelial degeneration in varying character and degree is the most frequent condition met with in all cases of diffuse nephritis, often exquisitely focal and sometimes remarkably selective. Thus in diabetes it only affects the cells of Henle's loops. The degeneration may range from very slight change to complete necrosis. Of the severer lesions of the kidney due to the diffuse action of soluble substances, Councilman notes one group in which glomerular lesions are most prominent. The most common cause of the glomerular affections he believes to be the acute infections. They may be acute, subacute, or chronic. The other form of chronic nephritis, chronic interstitial nephritis, causing a slow destruction of all parts of the kidney, the glomeruli least and secondarily, with a marked increase of connective tissue, is usually accompanied by arteriosclerosis. It is a composite disease; not one organ but many are affected. In this connection he gives the results of the anatomic study of the autopsies in cases of nephritis at the Boston City Hospital during the past ten years, and notices especially the marked heart enlargement in this form. The cases of amyloid infiltration are closely associated with it, but there is absence of heart hypertrophy. In the cases of chronic glomerular (parenchymatous) nephritis there also appeared to be a degree of cardiac hypertrophy, though to a less extent.

The frequent association of acute glomerular nephritis with pneumococcal infection is remarked, as also that of the acute interstitial form with diphtheria. Certain conclusions are forced on one, he says, by the careful examina-

tion of the kidneys in a large number of autopsies. One is that the kidney affection is only a part of a more general morbid condition. Kidney diseases cannot be considered as an entity; even the simplest bacterial lesions are secondary to infections elsewhere. Every acute infection probably leaves its traces in the kidney. Albumin and casts, though they mean injury to the organ, do not always indicate the severity of the condition, and too much importance may be attached to their occurrence. It is difficult to explain the association of lesions shown at autopsies, the cardiac hypertrophy and edema, and the numerous hypotheses that have been offered show our ignorance. It is not probable that anatomic studies can throw much light on the obscure problems of renal pathology. Clinical, pathologic, chemical, and anatomic methods must all be used, and the hypotheses offered tested by animal experiments. Only thus, and by reducing the questions to their simplest components, can such knowledge of chronic diseases as will permit us to form acceptable hypotheses for their explanation be obtained.

The Abrupt Onset of Typhoid Fever.—

MANGES, M. *Journal of the American Medical Association,* vol. xlv, Nov. 27, p. 1996, Dec. 30, 1905.

The importance of the irregular types of typhoid, especially of those cases in adults with abrupt onset, is emphasized, both on account of the importance and difficulties of their diagnosis and their high mortality. A distinction must be made between these cases and those that seem to be abrupt, but are not—the perforative cases. The records with true abrupt onset formed about 10 per cent of all cases in the Mt. Sinai Hospital; they are, therefore, not infrequent. Cases of abrupt onset may be ushered in by various symptoms, either with chills, single or repeated, severe pains in the head, abdomen, or other parts of the body, or by violent delirium; they may simulate appendicitis, pneumonia, nephritis, pleurisy, grippe, diphtheria, cerebrospinal meningitis, etc.; still another type are the hemorrhagic cases. A unique case in which the initial symptoms were tachycardia and heart failure is mentioned. Some cases of paratyphoid fever must also be differentiated from these cases of sudden onset. The cases resembling cerebrospinal meningitis are usually readily differentiated by their low leucocyte count, though clinically they may run an identical course for several days. The pneumotyphoid and pleurotyphoid types are well known and hardly require description. The types beginning with pain, simulating appendicitis, or with pain in the head, are noticed, and cases in which the diagnosis was difficult are mentioned. Another type is that marked by sudden high fever, with or without chills, the fever sometimes reaching its maximum of 105° to 107° in the first twenty-four hours, and often suggesting severe poisoning rather than typhoid fever. Death usually occurs at the end of the first week. Fortunately these foudroyant cases are rare.

The hemorrhagic cases of typhoid are often of sudden onset and run a rapidly fatal course. Malaria may complicate the onset of typhoid, and, aside from this, repeated small chills are very common in the beginning of the attack, and repeated severe chills without any malarial cause may occur. Sudden onset in the throat is rather rare and appears in the shape of the characteristic Bouveret ulcers or severe pharyngitis. Diphtheria of the pharynx may be associated with sudden onset of the disease in some cases. Another type is that of suddenly occurring severe nephritis with continuous fever, and the grippe type is still another of special importance and gravity as regards the diagnosis. The progress of the case, the roseola, the Widal reaction, etc., alone enable us to differentiate these cases. Manges explains these cases of sudden onset by a silent development of the germs in the system without

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presenting any marked clinical features until the disease is well developed. In some cases, however, a rapid development of the organisms in the body must be invoked to account for the condition. This rapid growth is favored by preëxisting infection of some kind, or other causes lessening the power of resistance. Whatever may be the explanation, the clinical fact remains that in about 10 per cent of cases of typhoid an abrupt onset may occur with aberrant clinical manifestations, and that in any case of severe acute illness of sudden onset, with marked disproportion between the severity of infection symptoms and the clinical findings, a properly applied test for the Widal reaction must never be omitted. The fact that this reaction occurs early in cases of typhoid fever of acute onset gives it a peculiar value in these cases.

Significance of Casts in the Urine.—

EMERSON, C. P. *Journal of the American Medical Association,* vol. xlvi, No. 1, p. 5, Jan. 6, 1906.

The writer gives a most interesting study of urinary casts, based on the investigation of the records of all the cases of nephritis and those resembling nephritis that have been admitted to the medical wards of the Johns Hopkins Hospital, about 500 of which came to autopsy. The classification and formation of these casts are discussed in detail, and the study includes not only the casts, but also the accompanying conditions, the various forms of nephritis and kidney degeneration, acute and chronic, as well as the non-nephritic conditions in which casts may occur. Casts occur wherever albumin might or does occur, but one may be present without the other. It is safe to say that it is the cells that are at fault. The lesion causing cylindruria may be very slight and temporary, some slight disorder of circulation or malnutrition of cells, as renal cells are among the most sensitive in the body. They may be a good index of the present condition of the cell, whether just irritated or totally destroyed, but they give no clue to the underlying conditions. It would seem indeed that the cells of a normal kidney could give a more lively demonstration of their disturbed condition by a vigorous output of casts than could those of a diseased kidney. The latter becomes accustomed to its condition and gives out no casts.

While casts and albumin do not always run roughly parallel, the former are of much importance in following a case of renal disease. Their temporary appearance, no matter how alarming in number and variety, means a transient and probably not serious disturbance; their continuance for days, weeks, or months, no matter how few, means chronic nephritis, and for them to remain two years means an incurable case. In nephritis a diminishing number, including fine granular and hyaline casts, means a subsidence of the acute process, while the reappearance of the coarsely granular, epithelial, and bloody casts means a flare-up. That they precede albumin in certain early cases of nephritis remains to be proved. In scarlet fever the casts may outlast the albumin, which ceases with the temperature, but in some cases there seems to be only cylindruria from the first, and this ceases with the fever. In typhoid pure cylindruria is not uncommon, and when albumin occurs casts may become more numerous after its disappearance. Phosphorus poisoning may produce only casts with the cells at all stages of fatty degeneration and fatty casts. Casts also occur in various acute infections, in the cancerous cachexia, in diseases of the central nervous system, in various lung diseases, as severe bronchitis and pneumonia, and in empyema. Casts alone are no index to the anatomic renal condition. They are often most marked in non-nephritic conditions, and in the most serious disorders they may be lacking. The more normal the cells the more readily do they form casts when dis-

turbed; in chronic conditions there may be few or none. The duration of their occurrence is important, and a case may be well followed by the casts. Epithelial, pus, and blood casts are more common and of less significance than is generally supposed.

Diameters of the Normal and Phthisical Chest.—

BESSESEN, W. A. *Journal of the American Medical Association,* vol. xlv, No. 27, p. 2003, Dec. 30, 1905.

When Woods Hutchinson demonstrated that the phthisical chest was round and not flat, he exposed a fallacy that had been current for decades. The phthisical chest is apparently flattened, due to the sliding forward of the shoulders on a rounded thorax. Bessesen has measured the chest in 502 normal individuals and 54 tuberculous patients. He comes to the following conclusions: (1) The use of bony landmarks for locating chest diameters is accurate and easily applied. (2) The use of median values for evaluating anthropometric data saves time and the results are more accurate than the arithmetical average. (3) Important points in the shape of the chest, as well as the movements and capacity, may be appreciated by observation of its principal diameters. (4) The development of the human chest passes through various stages, from the deep or dorsoventral to the broad or transverse type. (5) In the fetus or young babe the lower plane gives a greater depth and breadth than the mid-plane. (6) The fetus under 30 centimeters in length presents a dorsoventral type of chest—it is deep-chested. (7) The new-born child represents the transitional type of chest—it is round-chested. (8) During the first five years of life the most notable change is the rapid widening of the chest in its transverse diameter—it becomes broad-chested. (9) At puberty the chest takes on an increase in length over the diameters—the adolescent becomes long-chested. (10) From the eighteenth to the twenty-fifth year the development of the chest is fairly uniform in all its dimensions and represents the highest development—the broad, long chest. (11) The dorsoventral diameter increases at an even rate from birth to maturity. (12) The phthisical chest of adult years, in general, shows an arrest in development of the transverse diameter following puberty. (13) The phthisical chest is a narrow one, tending to the rounded form, with a relative elongation. A number of tables are given with the text.

Chronic Alcoholic Leptomeningitis.—

LAURIE, W. S. *Australasian Medical Gazette,* vol. xxiv, No. 11, p. 588, Nov. 20, 1905.

Reference is made to some of the confusing statements found in the standard writers regarding this disease. Gower says that in chronic alcoholic meningitis the convexity is chiefly involved. The symptoms are headache, slight delirium, mental failure, and slight optic neuritis. Osler says that chronic leptomeningitis is rarely seen apart from syphilis or tuberculosis. Bulloch (Allbutt's System of Medicine) says that apart from the truly gummatous lesions it is possible that syphilis can cause a chronic indurative leptomeningitis. The usual site is the sulci of the convolutions, more rarely on the base of the brain. The change is essentially a small thickening of the membranes, either diffuse or circumscribed. Oppenheim says that aside from the syphilitic forms chronic meningitis is a rare affection, though it does occur in cases of chronic alcoholism.

The writer describes three cases, in all of which a necropsy was obtained. In all the thickening was confined to the arachnoid and pia mater, the dura mater escaping. The pia mater was not involved in the sulci nor between the cerebral hemispheres. It did not adhere to the brain substance, as is the case in general paralysis of the insane. The occipital lobes escaped in all cases. The symptoms bore

a definite relation to the position and extent of the disease and depended mainly upon the pressure exerted by the thickened and contracted fibrous membranes. Headache, vomiting, Jacksonian epilepsy, tremors, paresis and incoördination, optic neuritis and delirium, or loss of memory or general mental failure, may be expected in such cases. The three cases recorded by the writer were accompanied by a high temperature near their termination.

Displacement of the Abdominal Organs.—

LERCH, O. *Medical Record,* vol. lxviii, No. 24, p. 927, Dec. 9, 1905.

Stress should be laid on the neurotic element both in the etiology and the symptomatology. The affection may be congenital and is often hereditary; it is most frequently predisposed to by relaxation of the abdominal walls, such as often follows childbirth. The disturbance of the nervous system is practically found in all cases, and nervous symptoms presenting the picture of hysteria and neurasthenia are always present. The trouble can only be developed on an inherited basis of neuropathic constitution. After describing the protean nature of the symptoms attending displacement of the stomach, colon, kidneys, liver, or uterus, the author presents several case histories illustrating pronounced phases of these disorders. The treatment, he says, should be prophylactic, by means of abdominal exercises and the use of a bandage if predisposition is recognized, and the same two measures must be employed if the trouble is already present. The author describes his own bandage, which is provided with anterior and posterior pads and with leg straps. Diet adapted to the condition of the stomach and intended to replace the lost fat, and rest, are the next requisites, as well as massage and mild hydrotherapeutic measures. Tonics and suitable exercise are also of value. The advisability of operative treatment requires careful consideration, for often the visceral dislocation is only part of the trouble; the severity of the suffering does not depend on the degree of dislocation, and correcting operations have been in many cases without any or without permanent result. If the defect to be corrected contributes to the trouble, and medical treatment has failed, an operation is indicated.

Light in the Production of Cancer of the Skin.—

HYDE, J. N. *American Journal of the Medical Sciences,* vol. cxxxi, No. 1, p. 1, January, 1906.

The writer comes to some interesting conclusions on the effect of light in the production of cancer of the skin. The skin of the human body in a certain proportion of individuals is hypersensitive to the action of the actinic rays of the spectrum. This hypersensitiveness may be shown in the production of either hyperemia, pigmentation, telangiectasis, atrophy, hyperkeratosis, or cancerosis of the skin, or by all at times in a determined order of succession. These changes of the skin are rare in early life and much more frequent in adults. The physiological pigmentation of the skin in the colored races gives them a relative immunity, and the colored races suffer less than the whites from cancer of other organs than the skin. This relative immunity may be due to the protection afforded by the pigmentation of the integument.

Tuberculous Peritonitis.—

CUMMINS, W. T. *University of Pennsylvania Medical Bulletin,* vol. xviii, No. 10, p. 272, December, 1905.

In a statistical inquiry the writer comes to the conclusion that approximately 25 per cent of all necropsies show active tuberculous foci. Of these three per cent show tuberculosis of the peritoneum. Of the cases of tuberculosis about 10 per cent show disease of the peritoneum, and of all forms of peritonitis 25 per cent are tuberculous. Males are more frequently affected than females, the proportion

being two to one. The disease is most prevalent between the ages of 20 and 40 years, and these cases represent over 40 per cent of the total. After the fiftieth year the disease is comparatively rare in the female. It is rather more frequent in the black than in the white race. The most frequent complication is tuberculosis of the lung. Among women general tuberculosis is responsible for 40 per cent of the cases. Among men only a small percentage show some lesion of the genito-urinary tract. The other serous surfaces are frequently involved, but instances of true serositis number about five per cent of the peritoneal cases. In laparotomies the fibrous form of the disease gives the greatest percentage of cures, and the ulcerous the smallest percentage. The average mortality is about three per cent. Not a few cases undergo spontaneous cure, but the ulcerous form never recovers.

SURGERY.

The Accessory Thyroids.—

MURPHY, J. B. *Journal of the American Medical Association,* vol. xlv, No. 25, p. 1854, Dec. 16, 1905.

Accessory thyroids often supplement or take on the function of the normal thyroid. They are found usually within a space roughly represented by an inverted trapezoid, the larger base of which is a line running between the apices of the mastoid processes, the smaller base a line tangential to the arch of the aorta, and the sides represented by the sternomastoid muscles. They have been found outside of this area, in the pleura, bones, abdominal cavity, and elsewhere, but such tumors must be considered as metastatic. Accessory thyroids are explained embryologically only when they occur in the above area. They may occur at any age, and are most common in females. In most cases there is no ostensible exciting cause, but in a few cases acute infection may be considered as such, and in several cases puberty was closely related to the development of these tumors. They are generally found at the base of the tongue, and vary in size from that of a cherry to that of an egg, or are even larger. The tumor is well encapsulated, not surrounded by an inflammatory area, and is bluish-red in color owing to the abundance of vessels. The consistency is soft, and it is sometimes difficult to decide whether one has to deal with a soft tumor or a cyst. The usually accepted theory of their origin is that they are remnants of the thyroglossal tract. While they may accompany normal thyroids they have been found in several instances to be the only thyroid existing. Two personally observed cases are reported.

The difficulties of diagnosis are noticed, and the lack of constitutional symptoms, and often at first of any symptoms whatever. Generally, however, when the true nature of a tumor of the neck is not well established an accessory thyroid should be thought of, and if a tumor is found at the base of the tongue or between it and the hyoid in or near the middle line, if there is no adjacent inflammatory reaction, if there are no marked subjective symptoms, if it undergoes periodic changes in size and tension, if the patient be a woman, and especially if she complains of some disturbance of menstruation, the condition is highly suggestive. In the differential diagnosis, besides the specific differences between accessory thyroids and other growths which are pointed out, particular attention is called by Murphy to the clinical course, the duration of the growth, and the presence or absence of the normal thyroid.

Treatment is both medical and surgical, but the administration of drugs is usually unsatisfactory. Iodide of potash may reduce the size of the tumor slightly, and Murphy suggests the use of thyroid tablets or the milk of thyroidectomized goats. The presence of a normal thyroid is to be assured before surgical

treatment is attempted, and it must be remembered that in some pathologic conditions of the thyroid the accessory growth may be physiologically compensatory. In such a case operation is justified only when the tumor causes symptoms of asphyxia; even then the surgeon must be conservative and remove only a part of the accessory thyroid. Extirpation is the only effective treatment, and the method of election is by the subhyoidal or submental route. The prognosis is good if the normal thyroid is present; the most unpleasant possibility is myxedema, which occurred in five of the cases tabulated. Recurrence of the tumor has been observed in six of the patients operated on.

Peritoneal Drainage.—

YATES, J. L. *Surgery, Gynecology and Obstetrics,* vol. i, No. 6, p. 473, December, 1905.

The writer in a radical article, to which was awarded the Senn medal for 1905 by the Surgical Section of the American Medical Association, takes up the subject from the historical, clinical, and experimental standpoints. His conclusions are that drainage of the general peritoneal cavity is physically and physiologically impossible. The relative encapsulation of the drain is immediate, and its absolute encapsulation occurs early (less than six hours in dogs), and can be retarded but not prevented. The serous external discharge is an exudate due to the irritation of contiguous peritoneum by the drain. There is a similar inward current from the potential into the general cavity. This external exudate diminishes with the formation of encapsulating adhesions. These adhesions form about any foreign body, their extent and density depending upon the degree and duration of the irritation. These adhesions are primarily fibrinous, but become organized in a few days. Their disappearance depends principally upon a mechanical factor—the ability of the involved surfaces to pull themselves or to be pulled loose. Drains should be as little irritating as possible, and should be removed as soon as they can be dispensed with. Irrigation through drains does not prevent adhesions and is dangerous. As soon as the drain is inserted, all intra-abdominal movements should be reduced to a minimum. As soon as the drain is removed, intra-abdominal activity should be stimulated to aid in the disappearance of the remaining adhesions. A drain diminishes peritoneal resistance where infection is present. Postural methods unless destined to facilitate encapsulation are both futile and harmful as far as drainage is concerned. Peritoneal drainage must be local, and unless there is something to be gained by rendering an area extraperitoneal, or by making from such an area a straight path of least resistance leading outside of the body, there is aside from hemostasis no justification for its use.

Intranasal Drainage of the Frontal Sinus.—

INGALS, E. FLETCHER. *American Medicine,* vol. x, No. 19, p. 784, Nov. 4, 1905.

The writer describes a new method of opening and draining the frontal sinus which he believes is an improvement on former methods. The histories of a few cases of obstinate frontal sinusitis are given, which illustrate the technique of the operation. One patient who had suffered from chronic involvement of the sinus for many years and had refused a radical operation was finally given relief by this method. A hollow drill or burr is used which is run over a pilot, by which means the normal opening can be enlarged without danger to adjoining parts. The instrument consists of a steel pilot from one to two millimeters in diameter, a hollow burr attached to a hollow flexible wire cable, and this to a hollow steel tube which has a shank for attachment to the chuck of a dental engine; also a spiral steel tube that fits easily over the cable of the burr

to prevent irritation of the nasal mucous membrane when the instrument is in operation (Fig. 1). A packer similar to a uterine packer, but bent at a curve corresponding to the outline of the frontal sinus, is used for

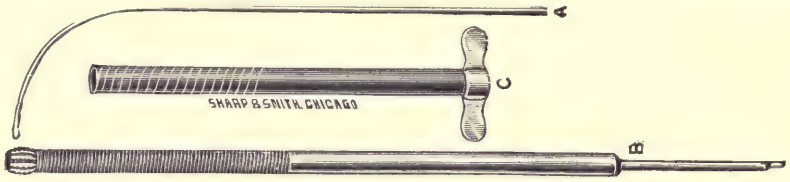

FIG. 1.—Ingals's pilot burr; two-thirds size. A, pilot; B, burr; C, shield.

drying or cauterizing the frontal sinus after the canal has been enlarged (Fig. 2). Later a self-retaining gold tube was made having an internal caliber of 5 millimeters (Fig. 3); also

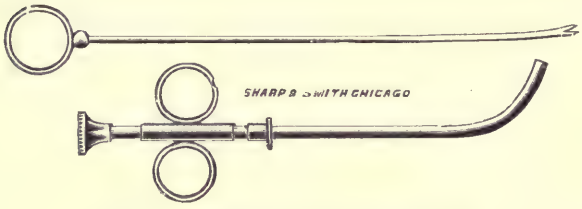

FIG. 2.—Frontal sinus packer; one-third size.

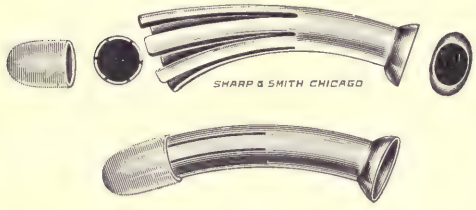

FIG. 3.—Ingals's self-retaining spring gold frontal sinus drainage-tube; full size. The upper portion of the cut shows the drainage-tube with springs bent, with a circle showing the actual size of the tube at the left, and to the left of this the capsule; to the right, actual size and form of the lower end of the tube. Lower portion of this cut shows the tube with capsule slipped over the springs ready for introduction.

FIG. 4.—Syringe for washing frontal sinus; two-thirds size.

a simple instrument for its introduction, and a small syringe for subsequent treatment of the frontal sinus by the patient (Fig. 4).

In operating the frontal sinus was first washed thoroughly with equal parts of hydrogen dioxide and a saturated solution of boric acid, and followed by a saturated solution of boric acid, which left the cavity clean. Under local anesthesia the pilot was passed into the frontal sinus and over it the hollow burr, and over this the spiral tube. The burr was then connected with the chuck of an electric motor. An inhalation of ethyl chloride was then given for about two minutes, by which time she was unconscious. The electricity was turned on, and with gentle pressure the burr run into the frontal sinus for about six seconds. A curette was then introduced, and the mucous membrane about the opening cut away so as to enlarge the canal. After this there was introduced the curved packer and the sinus filled with absorbent gauze. Then through the packer the gauze saturated with 95-per-cent solution of carbolic acid was introduced, cauterizing the frontal sinus, after which it was withdrawn through the packer. This was left in place, but it caused a great deal of pain, the reaction from the operation running the temperature up to 103.6°. Subsequently the patient washed out the frontal sinus daily with a solution of boric acid followed by a silver solution. A stronger solution was applied once a week when she came to the office. In about six weeks the pains returned over the frontal sinus, and it was found that the canal had narrowed to 2 millimeters by the formation of new bone tissue. The burr was again used to enlarge the opening and a gold tube introduced, which subsequently worked its way downward, after it had remained in position about six months. It was again intro-

duced, opening the springs farther, after which it remained in position, and the purulent discharge from the frontal sinus ceased.

The advantages claimed for the operation are that it is easily and quickly done in cases in which it is possible to introduce a probe through the nasofrontal canal. It establishes free drainage and furnishes a means whereby the patient may without aid wash out and medicate the sinus. The pilot effectually prevents perforation of the cerebral wall of the sinus. For this operation the patient more readily consents than one in which the eyebrow is opened. The operation will probably cure nearly all cases of acute suppurative frontal sinusitis, and a large percentage of chronic cases can be cured. Two out of three chronic cases in the writer's experience were cured, and there was marked benefit to the third. The advantages of the operation are such that it would be recommended in preference to the external operation in practically all cases. Even if a cure does not result the conditions will be improved for a radical operation.

The Short Narcosis, the Short Incision, and the Short Stay in Bed After Ideal Operations.—

HOLMES, B. *American Medicine,* vol. x, No. 25, p. 1025, Dec. 16, 1905.

The writer is a strong advocate of the short narcosis, short incision, and short stay in bed after ideal operations. He believes too much time is often spent by the patient on his back after operation, and too little by the surgeon at the bedside and in the laboratory before the operation. In order to make the stay of the patient short after surgical intervention, he should be studied in the hospital for days or even weeks before operation is undertaken. Dr. Holmes has found that patients can readily be kept anesthetized the necessary twenty minutes or half an hour by the employment of gas with only occasional resort to ether. In a few instances, on account of obesity, chloroform has been used to continue the anesthesia. The short incision is one of the dictates of good surgical judgment, as it inflicts the minimum amount of traumatism and gives adequate access to the field of operation. With the small incision the complications which the protrusion of abdominal viscera add to the operation are unknown. Operators who have been accustomed to use incisions 4 to 6 inches long are surprised to find that they are able to accomplish the same results more rapidly, with less traumatism, and with fewer postoperative discomforts to the patient with an incision 2 inches long or 1½ inches long. The duration of the operation is curtailed, the intoxication and the discomforts of the anesthetic are lessened, the danger of hernia is minimized, the necessity of a long stay in bed is obviated, the chances of infection through the introduction of many stitches diminished.

Congenital Stenosis of the Urethra.—

GARDINER, F. E. *Medical Record,* vol. lxviii, No. 26, p. 1013, Dec. 23, 1905.

This malformation is far more frequent than would be supposed from the scanty literature. Foisy in a recent thesis collected 104 cases, and now the reported instances of the condition have reached a total of 110. The author outlines the development of the urethral canal, and says that the chief points to be borne in mind are the following: (1) The urethra is formed by three embryological portions: (*a*) the posterior urethra developed from the urogenital sinus, and separated from the next portion by the cloacal membrane; (*b*) the spongy portion developed from the urethral groove and closed during the first stages of its development by the cloacal membrane at its posterior extremity, and the epithelial wall of the glans at its anterior; (*c*) the balanic portion developed independently. (2) The spongy and the balanic portions—*i.e.*, the whole anterior urethra—are not derived, as the pos-

terior, from a hollow embryonic organ, but on the contrary develop in a solid, continuous mass of epithelial cells. It is therefore not surprising that congenital strictures are more common in the anterior than in the posterior urethra. The symptoms are then described at length, and it is stated that nocturnal incontinence and diurnal frequency of micturition are characteristic features. Incontinence in children, if not accounted for by some evident external malformation, is frequently due to a congenital stricture and not to "essential incontinence," or to "congenital irritability," as it is usually alleged. In adults every stricture is not necessarily the result of trauma or gonorrhea, and gonorrheal strictures develop much more quickly on the basis of an already existing congenital stenosis. The treatment is gradual dilatation; only rarely is it necessary to resort to internal or external urethrotomy.

Injury to the Thoracic Duct.—

PAIN, E. M. *Australasian Medical Gazette,* vol. xxiv, No. 11, p. 592, Nov. 20, 1905.

Reference is made to the paucity of literature on injuries of the thoracic duct. Cheyene and Durghard report two cases which were followed by recovery, notwithstanding there was a considerable amount of swelling due to extravasated lymph. They recommended firm pressure after close stitching of the wound. Jacobson reported one case in which the duct was opened which was followed by a fatal termination. Keen has reported four cases of injury to the duct during operations, three of which recovered. Rose and Carless infer that in cases of complete section which have recovered the duct probably opens by several mouths into the subclavian vein, only one of the branches having been injured. Herbert Milton in a personal communication to the writer states that he once wounded the thoracic duct in removing a tuberculous gland, and was able to close the opening by a longitudinal suture. The writer's case was a patient who for some months had suffered from tuberculous glands and from a moderate temperature. In removing a mass of glands the thoracic duct was divided proximally to the junction of the lymph channels from the arm, head, and neck. A fine probe was passed into the lumen of the proximal end, which was followed by a flow of venous blood, showing that the probe had forced open the valve at the entrance of the duct into the vein. The patient made a good recovery, apparently being little inconvenienced by the section of the duct.

A New Method of Operating on Dupuytren's Contraction of the Palmar Fascia.—

KEEN, W. W. *American Journal of the Medical Sciences,* vol. cxxxi, No. 1, p. 23, January, 1906.

Two years ago the writer operated on a woman for a contraction of the palmar fascia, the incision being made in the usual manner along the most pronounced ridges. The case being an unsuitable one for general anesthesia, neural infiltration was used. When seen again the patient had many nodules involving nearly the whole of the palmar fascia, and it was evident that unless something were done all of the fingers would contract. In operating the skin was infiltrated just above the wrist over the median and ulnar nerves with the following solution:

Sol. adrenalin chloride	10 Cc.
Beta-eucaine	2 grammes.
Sodium chloride	8 drachms.
Distilled water, q. s.	200 Cc.

The nerves being exposed a few drops of the same solution were injected into their sheaths. This not giving a satisfactory anesthesia four or five drops of a four-per-cent solution of cocaine were injected into the same nerves. The incisions began at the ball of the thumb on a line of the interspace between the forefinger and middle finger, and went down almost to the web between the forefinger and

middle finger; then transversely to a point just above the web between the ring and little fingers, and up to the ball of the little finger at a point corresponding to the beginning of the incision on the other side of the hand. The dissection of the flap was begun at the transverse incision corresponding to the knuckles, and went directly down to the sheaths of the tendons. The palmar fascia was dissected up with the flap and then removed from its under surface. To dissect out the fibers going to the index and little fingers the skin was undermined. After the operation union took place by first intention. The patient was discharged from the hospital with almost normal motion of the fingers.

In this particular case the diffusion of the nodules all over the skin of the palm was such that the ordinary operation for dissecting out the contracting bands would have done no good. By dissecting up the skin alone there would almost certainly have resulted a slough of the flap. By lifting a flap consisting of all of the tissues of the palm down to the sheath of the tendons sufficient nourishment is afforded to the flap to prevent sloughing, and at the same time it exposes the palmar fascia so that it can be removed. Such a method of operating on the palmar fascia may be desirable in more advanced cases in which distinct bands have already formed.

Final Results of the X-ray Treatment of Cancer.—

COLEY, W. B. *Annals of Surgery,* vol. viii, p. 161, August, 1905.

During the past three years the writer has treated 167 cases of malignant disease. In five of 68 cases of sarcoma the disease completely disappeared, but in every one of these there was recurrence in a few months. His conclusions are:

1. The *x*-ray exerts a powerful influence upon cancer cells of all varieties, but most marked in cases of cutaneous cancer.

2. In some cases, chiefly in superficial epithelioma, the entire tumor may disappear, probably by reason of fatty degeneration of the tumor cells with subsequent absorption.

3. In a much smaller number of cases of deep-seated tumors, chiefly cancer of the breast and glandular sarcoma, tumors have disappeared under prolonged *x*-ray treatment. In nearly every one of these cases, however, that has been carefully traced to final result, there has been a local or general return of the disease within a few months to two years.

4. In view of this practically constant tendency to early recurrence, furthermore, in the absence of any reported cases well beyond three years, the method should never be used except in inoperable cases, or as a prophylactic after operation, as a possible, though not yet proven, means of avoiding recurrence.

5. The use of the *x*-ray as a preoperative measure in other than cutaneous cancer is contraindicated: (1) because the agent has not yet been proven to be curative; (2) because of serious risks of an extension of the disease to inaccessible glands or to other regions by metastases during the period required for a trial of the *x*-ray.

Thyrotomy Versus Laryngectomy.—

JACKSON, C. *Medical News,* vol. lxxxvii, No. 24, p. 1116, Dec. 9, 1905.

Attention is called to the gravity of chronic hoarseness. It not infrequently points to malignant disease, and if the diagnosis is made early a thyrotomy is possible, which may save the patient's life as well as preserve the voice. If the diagnosis is made late total laryngectomy offers the only hope of prolonging life. Two contrasting cases are described, in one of which laryngectomy was done. By a suitable contrivance a useful whisper voice was obtained, but eight months later there was a recurrence, which terminated the case. Another case is described in which the disease

began as a simple hoarseness due to a squamous-celled epithelioma on the under surface of the right vocal cord. The thyroid cartilage was split in the median line, both halves retracted, and the growth with a wide area of surrounding healthy tissue including the right vocal cord was clipped out. The wound healed in ten days; the voice was a loud whisper during the first three months, after which there was rough phonation, which was later followed by a practically perfect speaking voice. The writer regards endolaryngeal operations in cancer as practically a waste of time. He emphasizes the importance of early diagnosis and the discovery of the disease while a thyrotomy is still possible. The surgery of malignant disease in the larynx is favorable when the disease is recognized early.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Habit Spasm in Children.—

STILL, G. F. *Lancet*, vol. clxix, No. 25 of vol. ii, p. 1745, Dec. 16, 1905.

This name has been given to certain oft-repeated and seemingly purposeless movements which most commonly affect the face or head, and which although they may change in character from time to time are for varying periods persistent in kind, whether the movement be a simple twitch of one muscle or more complicated action of several muscles. The term "tic" lacks the descriptive merit of "habit spasm." Simple and easy as the habit spasm seems it is difficult to cure. The most frequent form of spasm is a rapid blinking of the eyes or a more forcible closure of the lids. This was present in 47 out of 100 consecutive cases under the writer's care. Less common is a movement of the eye itself, which was present in five of the cases. The next most frequent variety of the movements is a twitching of the nose, which may turn to one side, or a sudden drawing up of one angle of the mouth, or the twitching may affect the forehead, causing a sudden frown or an elevation of the eyebrows. These various facial contortions were present in 48 per cent of the cases. A common spasm is a sudden anteroposterior jerk of the head or a lateral rotation, as in negation. The head may be rotated toward one shoulder only, or it may be drawn upward. Some such head jerk was present in 30 per cent. The limbs are less often affected, but the upper limb more frequently than the lower, the former being involved in 22 per cent and the latter in 9. The commonest movement of the upper extremities is a sudden elevation of one or both shoulders. All sorts of curious movements are made, such as snapping the fingers, abduction of the arms and beating them against the thighs, or clawing movements have been noted. The movements of the lower extremity are equally curious. One boy would at intervals paw the ground like a horse. The trouble had begun with blinking of the eyes two months earlier. When this ceased he acquired a habit of frequent grunting, and at another time sudden head jerks.

A common form of habit spasm is the frequent repetition of some particular sound, which may be like that made in clearing the throat. Various irregularities are noted in habit spasm, the term spasm being scarcely applicable to some of the quasi-purposive movements, which sometimes alternate with a simple spasm. Frequently one habit spasm will be replaced by another. Habit spasms tend to diminish when the child is under observation. Habit spasm is only slightly more common in girls than in boys. Children with this disorder are nervously unstable. They are often restless, suffer from sleeplessness and headache. A large proportion of the cases are described as nervous and excitable. In some cases there was irritability and quick

temper. Disturbances of sleep were very common, and in 20 per cent there were definite disorders of sleep, such as sleep-walking, night terrors, or troublesome insomnia. Headaches were common, and enuresis was noted in 10 per cent of the cases. In 7 per cent of the cases convulsions had occurred in infancy or early childhood. Given the nervous tendency, modern school life or other strain may lead to the development of habit spasm. It is possible that habit spasm may have its origin in a frequently repeated voluntary movement.

Habit spasm is sometimes mistaken for chorea. The distinction is easily made in most cases, though there are a few in which the movements approximate those of a limited and slight chorea. From the standpoint of treatment it is important to differentiate the habit spasm from chorea. The latter require rest, while the habit spasm is more likely to be benefited by an open-air life on the seashore or on the farm, a change to the seaside or to the country being by far the most efficient thing in the management of these children. The strain of school life should be intermitted. In some instances where the family surroundings are unfavorable school life may be of positive benefit. The parents should be instructed that scolding and punishment is generally useless and may be harmful. All forms of excitement and fatigue should be avoided, late hours having an especially bad influence in such cases. Local irritation is to be removed, the eyes and teeth being the most frequent sources. The most useful drugs are arsenic and bromides. These may be continued for three or four weeks. Ergot has seemed to be of value in some cases, given with 4 or 5 minims of tincture of nux vomica. In intractable cases simple change of environment, especially living among strangers for a time, will sometimes do more than any drug treatment.

Dysmenorrhea at Puberty and Uterine Fibroids.—

REESE, F. D. *Medical Record,* vol. lxviii, No. 26, p. 1017, Dec. 23, 1905.

The writer presents the following questions: (1) Is dysmenorrhea a symptom denoting the presence of uterine fibroids at puberty? (2) Are the causes of dysmenorrhea exciting causes of fibroid tumors of the uterus? As a result of his own experience and of the statements of other authors he considers that there is no doubt that fibroid tumors exist *in utero* previous to menstruation, and are the exciting causes of dysmenorrhea in many cases. Of the last thirty-one cases of uterine fibroids that have come under the author's observation, all with but one exception have begun menstruation with severe pain. He also believes that the various causes of dysmenorrhea are possible causes of uterine fibroids, and cites numerous observations from the literature in support of this view. An illustrative case is described, showing the following four stages of progress in the evolution of the tumor: (1) Dysmenorrhea at puberty; (2) a deformity of the uterus (extreme anteflexion) discovered at the first local examination, at the age of 30 years; (3) at 36 years of age there were backache, leucorrhea, and an enlarged uterus with a hard, uneven surface; (4) at 38 a tumor of the uterus had developed to such an extent that the patient detected it herself through the abdominal walls. The indications accordingly are to relieve the causes of dysmenorrhea at puberty in order to avoid the necessity of operating on fibroid tumors later.

Ethyl Chloride as an Anesthetic for Infants.—

MURRAY, F. *Lancet,* vol. clxix, No. 22 of vol. ii, p. 1542, Nov. 25, 1905.

Reference is made to the fact that ethyl chloride is not generally recommended for infants, though it is the best means of procuring short anesthesias of from five to fifteen

minutes in children of any age. It appears to be as safe for babies as for older children, and it does not produce bad after-effects. The writer has administered it to 150 infants under a year old. The youngest cases were five and fourteen days respectively, and a large proportion of them were from five to seven weeks old. They included a number of weak and ill developed children, common to hospital out-patient departments. It is especially useful in respiratory embarrassment. It is useful in tenotomy, sounding, circumcision, and the removal of adenoids, lipoma, or polypi. For most such operations an anesthesia of ten or fifteen minutes is sufficient. Infants suffer less from the after-effects of the drug than adults.

One of the principal factors in causing shock in children is the length of anesthesia. Hence ethyl chloride is valuable in those cases in which the patient is in bad condition. It is the easiest and pleasantest anesthetic to inhale. The smell of the drug is not obtrusive, and it is such a strong respiratory stimulant that the patient does not require to make an effort. On the contrary it promotes respiration. This is its chief danger, for if the respiratory center is overstimulated, there may be a tonic contraction of the diaphragm and the patient die from paralysis of respiration. The alternative anesthetic for babies is chloroform and its mixtures, which entail a certain amount of risk for very young and weak infants.

Eclampsia and Renal Disease.—

BROWN, P. K. *Journal of the American Medical Association,* vol. xlvi, No. 2, p. 85, Jan. 13, 1906.

The physiologic strain on the kidneys in pregnancy is such as to cause albuminuria in a large proportion (80 per cent) of cases, and albumin and casts are found in at least 30 per cent of cases. There is no reason to suppose that the renal condition thus revealed is the cause of eclampsia, but it is likely that there is some connection between the extra-renal cause of the eclampsia and the albuminuria, in view of the nearly constant association of the two. No normal end-product of metabolism nor any intermediate product, so far as known, is the cause of eclampsia, but there is reason to suppose that deficient thyroid activity plays a part at least in some cases. There are probably several causal factors working singly or together. The most significant experimental work, up to this time, points to the placenta as the place where the toxic substances responsible for eclampsia are formed. These same substances are probably the causes of the headache, edema, abdominal pain, and particularly the albuminuria in non-eclamptic and non-nephritic cases. The nervous systems of pregnant women are abnormally sensitive, and their blood has been shown to be abnormally toxic. There is no conclusive proof of any increased or lessened toxicity of the urine. King's own personally conducted experiments have shown that the muscles of pregnant guinea-pigs can be thrown into convulsions more easily than those of non-pregnant animals. Two cases are reported illustrating the extreme variability of the urea elimination by the urine of women presenting pathologic conditions in pregnancy, but not having eclampsia.

Treatment of Bronchopneumonia.—

VISANSKA, S. A. *Medical Record,* vol. lxviii, No. 25, p. 975, Dec. 16, 1905.

The first requisite is to get the confidence of the family. Abundant fresh air must be secured by having the windows opened above and below, and if possible an apartment with a fireplace should be chosen as the sick-room. Of the many external applications recommended he prefers the hot mustard bath. The child should remain in it till there is a pink glow over the body, and should then be wrapped in a blanket and placed in bed, when as a rule it falls asleep. At the same time the high nervous tension is relieved, the child breathes

more easily, the pulse is not so rapid, the capillaries dilate, and the little patient often breaks out in a copious perspiration, which carries off the toxins, thereby throwing less work on the heart, kidneys, and intestinal canal. These baths should be repeated as often as necessary. Hot camphorated oil, with mustard rubbed into the chest, is an efficient application if pleurisy is a prominent symptom. Several prescriptions for cough mixtures are given. Whisky and strychnine are the two preferable stimulants, and when the pulse is above 130 tincture of digitalis is used, which has proved very valuable in the author's experience. It is advisable not to give the patient any water for several minutes after swallowing the dose of digitalis, which may be administered in a few drops of syrup, as water precipitates digitoxin. If the child is not breast-fed, broth, beef, milk, and egg albumen will constitute the principal articles of diet.

FORENSIC MEDICINE.

The Feeble-minded Criminal.—

Lancet, vol. clxix, No. 22 of vol. ii, p. 1556, Nov. 25, 1905.

In an editorial discussion of the feeble-minded criminal the *Lancet* refers to the last annual report by H. Smalley, the medical inspector of prisons for England. The inspector takes for his criterion the inability of the criminal to conform to the ordinary penal discipline. The *Lancet* in referring to this says that it may at first seem a crude division, but it is based on sound psychological principles. As the penal discipline may be held in a measure to represent the moral discipline of the world, only in a more certain degree the failure to conform is followed by the immediate pains of retribution. "It is therefore quite legitimate to regard the inability to reach this low standard and to conform to the demands of penal discipline as evidence of a definite and extreme degree of mental defect. It serves in fact as a line of demarcation which cuts off from the mass of weak-minded criminals a distinct group of which we may affirm that they would be incapable of adaptation to any conditions of social environment however favorable, and that they are unfit for free life." The incorrigible character of this group renders them of special interest to the penologist. Dr. Smalley says that they begin their criminal career at a relatively early age, generally about the period of adolescence, when they are forced to enter on the struggle for existence. They oscillate between the prison, asylum, and workhouse, with brief intervals of freedom. As a rule the offenses committed are relatively trivial, but this is subject to many exceptions: thus an exaggerated sense of injury aroused by some trivial incident may impel them to wreak vengeance in murder or arson. The number of criminal defectives of this class does not seem to be large. Dr. Smalley recommends their detention in special institutions, the expense of which would be covered in part by the saving in cost now involved in repeatedly prosecuting them and maintaining them in prison. There can be no question of the advantage that would accrue to the community by the adoption of such a scheme, as it would secure that adequate protection of society which is the most important element in dealing with a problem of this character, and which is not met by the present cumbersome and defective methods.

Meningitis Due to Camphor Poisoning.—

Walker, T. H. *Lancet,* vol. clxix, No. 21 of vol. ii, p. 1472, Nov. 18, 1905.

The case reported is that of a child 2½ years of age, who was found unconscious, covered with cold perspiration, and with an uncountable pulse. These symptoms were noted at two o'clock in the afternoon; at eight the

same morning a teaspoonful of camphorated oil had been given in mistake for castor oil. Vomiting had been frequent. Potassium bromide was injected into the rectum. This controlled the convulsions. An improvement was gradual until the third day, when symptoms of meningitis developed. The case appeared to be almost hopeless, but under injections of caffeine there was slight improvement and a gradual recovery, with the exception of a paralysis of the right arm and leg.

PUBLIC HEALTH.

The Logical Basis of the Sanitary Policy of Mosquito Reduction.—

Ross, R. *Science,* vol. xxii, No. 570, p. 689, Dec. 1, 1905.

The reduction of mosquitoes is an important sanitary measure which up to date has not been largely employed. In part this has been due to the fact that there has been no accurate method for estimating the number of gnats in any locality. Personal impressions may be expressed by the term small or large, but there is as yet no accurate mathematical method. Mosquito reduction is only a part of a larger subject, namely, the local reduction of living organisms. The living unit cannot progress through space and time for more than a limited distance. The diffusion of living units must therefore be circumscribed. The life of gnats, like that of other animals, is governed by fixed laws. Propagation can never exceed nor mortality fall below certain rates. Local conditions may be favorable either to the birth-rate or to the death-rate, and the local population must depend upon the food supply. Certain unfavorable conditions depress the number, and artificial depression of the density of the population resolves itself into the direct destruction or the artificial creation of unfavorable conditions.

It is impossible to destroy the adult winged gnat, but it is generally possible to destroy the larvæ, which must live for at least a week in suitable waters. In the case of drainage the results are more or less permanent, while the destruction of the larvæ by poisoning demands constant repetition. The arrest of propagation over an area however small is equivalent to the destruction of a certain number of insects. If the suppression of propagation is carried out in a small area the results will be practically *nil,* as the mosquitoes would have no difficulty in traversing a small distance, but if the propagation is suppressed over an area of ten miles, then every gnat reaching the center would traverse ten miles. If the radius of suppression be still further advanced, a state of affairs must be reached in which no mosquitoes at all can reach the center. How large must such an area be? The answer depends upon the distance which a mosquito can traverse, not during a single flight, but during its whole life, and also upon certain laws of probability as to its wanderings. If 1000

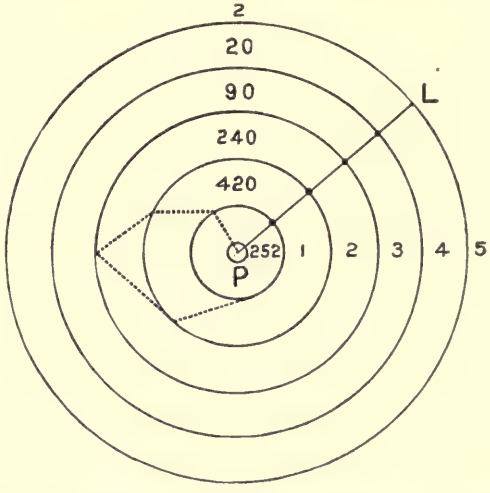

DIAGRAM 1.—Graphic illustration of the mathematics of mosquito migration.

gnats were liberated from a box in the center of a plain, their distribution will be indicated by the calculus of probabilities. If the average

life of the insect contains n stages and each insect can traverse an average distance L during one such stage or element of time, then the extreme average distance to which any insect can wander during the whole of its life must be nL. It follows from the known values of binomial coefficients that if the whole number of gnats be divided into groups according to the distance at which their bodies are found from the box, the probabilities are that the largest group will be found at the first stage—that is, close to the box—and that the successive groups as we proceed further from the box will become smaller, until only a few occur at the extreme distance, the probable limit of migration. The same reasoning will apply to a breeding-pool or a vessel of water—that is, the insects coming from such a source will remain in its immediate vicinity providing that the surrounding area is uniformly attractive to them.

The law of distribution may be called the centripetal law of random wandering. It ordains that when living units wander from a given point guided only by chance they always tend to revert to that point. The principle which governs their to-and-fro movements is that which governs the drawing of black and red cards from a shuffled pack. The chances against drawing all the 26 black cards from such a pack without a single red card are enormous; as are the chances against a mosquito guided only by chance always wandering on in one direction. The random movements of the living unit tend to be alternately backward and forward, which keeps it near the spot whence it started. Even where the wanderings are determined by the search for food, such for example as when the breeding-pool lies in the center of a large city, the centripetal law will still hold good, as there is no reason why the insect should attack one house more than another. There is no reason why a mosquito which has flown straight from a pool to the nearest house should next fly to another house in a straight line away from the pool rather than back again or to the right or left. The insects will always persecute those houses which lie in the immediate vicinity of their breeding-pool.

Self-evident as these arguments appear it is not understood by many, who seem to think that mosquitoes radiate from a center and shoot forever onward into all parts of the country as rays of light do. Accepting this fallacy without question they argue that it is useless to drain local breeding pools because of the influx of mosquitoes from without. Such an influx exists, but it does not compensate for local destruction. If a tract of country be taken which contains a number of mosquito breeding-pools with houses and other feeding-places lying between them, if on one side of a line all of the pools are drained to the right of it, leaving those to the left intact, then all the insects on the left of the line must be natives of that part, and all those on the right must be immigrants. Diagram 2 shows graphically the varying density under such conditions. Before the area to the right is drained migration from one territory to the other must have been equal and opposite. After the drainage the insects breed as before on the left of the line, and some continue as before to

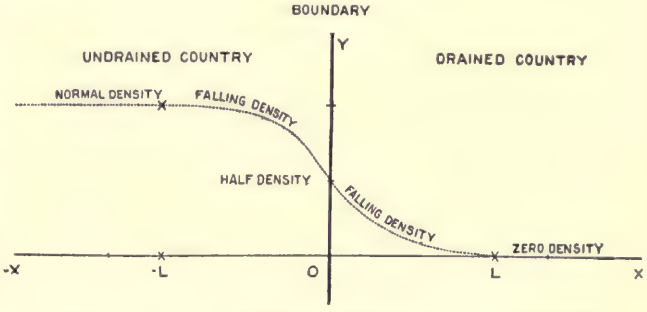

DIAGRAM 2.—Curve of falling mosquito-density due to drainage on right of boundary. L and $-L$ are the limit of migration on either side of the boundary.

cross over it into the drained country, but in the latter propagation is checked, and the migration from it to the left of the line which used to exist ceases. The mosquitoes gained by immigration into the drained country are lost to the undrained country. In the diagram the line giving the mosquito density falls very slowly at first, and then near the boundary very rapidly, subsequently sinking slowly to zero. The vast bulk of immigrants must remain comparatively close to the boundary, and the mosquito density on the boundary itself must always be only one-half of the original density. As a general rule the number of immigrants into any area must be very slow or inappreciable within a short distance of the boundary line.

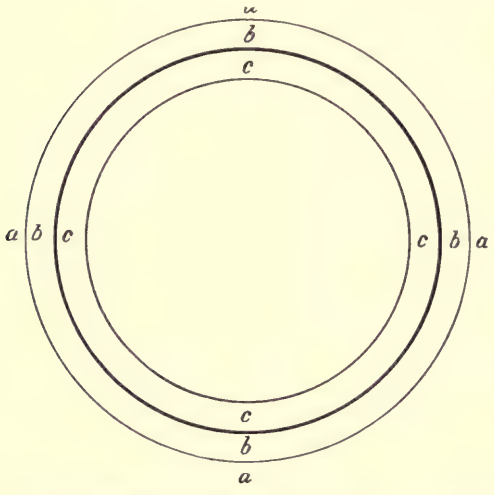

DIAGRAM 3.—Effect of drainage of a circular area. *b*=boundary of drained area. Mosquito-density begins to diminish at the circle *a;* becomes one-half at the boundary *b;* and is small, inappreciable, or zero at the circle *c*.

Diagram 3 represents the effects of thorough suppression of propagation within a circular area. The circle *a* represents the normal mosquito density before the operations were commenced; *b* represents the circle bounding the drainage operations; at the circle *c* and within it the density will be small, the distance from *a* to *b* may be taken as being the same as from *b* to *c*. The mosquitoes penetrating to *c* must be drawn from the zone between *a* and *b*. Sufficient data is not at hand to calculate the actual distance between *a, b,* and *c*. It will depend in a certain measure on the activity of the species of insect concerned and on the existence or absence of special local attractions, but this fact does not discredit the general principles involved.

The writer does not believe that wind is important in scattering mosquitoes, the insect being extremely tenacious of locality. Instances of their being driven far by winds are frequently quoted, but they are probably bred in many such cases in unobserved pools close at hand. The wind hypothesis is frequently used by municipal officials as an excuse for doing nothing—it is convenient to blame a marsh miles distant for breeding mosquitoes which are really produced by faulty sanitation in the town itself. The introduction into towns by trains and carts is possible, but it is infinitesimal compared with those that fly or which are bred in the town itself.

The writer sums up the argument with the statement that for every living unit there is a certain distance which it may cover, providing it always moves in the same direction. This distance is the limit of migration, but scarcely one in many millions of living units is ever likely to reach it, not because the units do not possess the capacity for covering the distance, but because the law of chances ordains that they shall scarcely ever continue to move always in the same direction. Constant changes of direction which must take place in all random migration tend to leave the large majority of units near the neighborhood where they were born. This mathematical analysis is essential in any study of mosquito reduction, and essentially negatives the statement that local anti-propagation measures are rendered useless by immigration.

Preventive Medicine in the Country.—

ABBOTT, A. C. *University of Pennsylvania Medical Bulletin,* vol. xviii, No. 10, p. 285, December, 1905.

The most conspicuous development in preventive medicine has been shown in the cities. The deficiency in the country is not due to a lack of desire or of intelligence, but often to a lack of knowledge of the fundamental features of preventive medicine. A public health service should be based on a common-sense application of accurate scientific study of the conditions under which we live. Elaborate or expensive artificial aids are not essential. The problem of preventive medicine in the country differs from that in the city only in degree. In both city and country there is the same starting-point, the individual household, and as a rule the successful application of hygienic principles is easier in the country than in the city. The country residents should remember that many diseases of domestic animals are transmissible to man, and that insects, especially flies and mosquitoes, are active factors in the dissemination and perpetuation of certain types of disease; also that rigid supervision of contagious diseases is quite as important for those living in the country as it is for those living in the city. In the disposal of excrement the same plan is followed as was popular centuries ago. It is deposited upon the soil or in shallow pits without deodorization or disinfection. As a rule this does no particular harm, but with the advent of disease in the family if no change in the plan is made accidents of a serious nature may result. It is needless to say that it should never be allowed to accumulate, and the access of flies and decomposition should be prevented by the addition of dried loam, ashes, or lye. In houses with modern plumbing there is no better means of disposing of the sewage than by subsoil irrigation. In small villages having a common water-supply the best means of getting rid of its fluid waste is by intelligently manipulated surface irrigation if the character of the soil admits of it. Cesspools and pits where putrefaction goes on for indefinite periods are a nuisance.

For the country householder the water-supply is a serious danger. If it is derived from a shallow well, the surface should be kept as free as possible from contamination. The proximity of cesspools and wells should never be tolerated. This was the condition which gave to Munich its unenviable preëminence as a center of typhoid fever. The well is often open to pollution by surface washings, which can be obviated by surrounding the well with a wall made of brick or cement. Open wells can often be converted into pump wells by providing them with a well pipe and filling in around it with clean, fine sand. This sand acts as a filter and diminishes the danger both from surface washings and pollutions from the deeper layers. Wells that have become infected may be disinfected providing they can be thrown out of commission for a brief period. The generous use of chloride of lime or carbolic acid in a well, together with the scrubbing of all surfaces with the solution and the repeated emptying of the well after an appropriate period until all trace of the disinfectant used has disappeared, results as a rule in the elimination of all danger, providing the source of pollution has been checked.

The common practice of fertilizing market gardens with sewage or night soil has many objections. It has not been shown that in this way disease is directly transmitted, but as many vegetables are consumed in a raw state it is easily possible that infection may occur in this way. No fertilizer of this sort should be used until it has been mixed with two per cent of freshly burned lime, which, though it does not render the mass sterile, nevertheless robs it of its dangerous, infective ingredients.

It has been shown that certain types of disease, especially malaria and yellow fever, depend for their existence solely upon the activities of mosquitoes. Certain other blood-sucking insects may cause other specific infections in man and in animals. Many of the non-blood-sucking winged insects commonly seen about the habitations of man, especially the common house-fly, may mechanically carry infective matters into the dairy or pantry. Aside from the question of disease common comfort demands the destruction of the breeding places of mosquitoes and flies. The most insignificant collection of water serves as a hatching place for the eggs of the mosquito, and under normal conditions four or five broods of young may be hatched in a season. Fresh horse manure is a most favorable nidus for the propagation of the common house-fly. No useless accumulations of water should be permitted. If drainage cannot be practiced oil should be spread upon the surface of all pools once in three weeks in the proportion of a teaspoonful to the square yard. Manure should never be piled openly and exposed about the premises. It should be stored in covered pits or carted away and spread upon the land. Every opening to a house in the country should be carefully protected by screens, and every patient suffering from transmissible disease should be carefully protected from the access of insects.

Milk and dairy products are peculiarly adapted to the conveyance of disease, and may unless care is exercised become efficient disseminators of infection. Three principles should govern the sanitary control of the dairy: The production of clean milk with good keeping qualities; the production of milk that conveys no disease from the cow to the consumer; the production of milk under such conditions that it does not serve as a vehicle for the conveyance of disease from one human being to another. Clean milk is not only desirable from a sanitary and economic standpoint; a dirty milk, whether specifically infective or not, does not keep and is an indication of both ignorance and carelessness. Unclean milk is bad business. The correction is not difficult; it simply means cleanliness of the cattle and of all the appurtenances of the stable. Much attention has been devoted of late years to the question of tuberculosis in cattle. While this should not be minimized, there has been a tendency to overlook certain other factors, such as inflammations of the udder. These add to the milk the pus organisms, which are important factors in the development of intestinal troubles. The possibility of conveying diseases of man from one individual to another by milk has not been certainly established, but until the contrary is shown common prudence dictates that those only who are well should be employed about the dairy. The sanitary requisites of the dairy call for nothing that is unreasonable.

Cases of contagious disease in the country should be reported, as the location of contagious diseases in the rural districts should be definitely known and published at frequent intervals. This is not only important from the standpoint of notification, but also when the food and milk supplies of communities are involved. The routine medical examination of schoolchildren is also important and prevents wide-spread outbreaks of disease.

B. J. C

MEDICINE

Vol. XII. DETROIT, MICH., MARCH, 1906. No. 3.

EDITORIAL.

THE ORIGIN OF CANCER.

The work which has been done under the auspices of the Cancer Research Fund has been so striking that a summary of the results so far obtained is of great interest. E. F. Bashford in a recent address (*British Medical Journal,* Dec. 9, 1905) gives a summary of the work already accomplished. The conclusion is drawn that as a problem in human pathology the solution is impossible, but the puzzle may be unraveled by regarding it as a biological problem and treating it by the experimental method. It is in this broad spirit that the work of the Cancer Research Fund was undertaken. In formulating the work it was difficult to overcome bias, as some kind of working hypothesis must be adopted in coördinating the inquiry.

The prevailing theories of cancer regard it as due to embryonic inclusions (Cohnheim) and to infection; nearly all the work that has been done has been directed to proving or disproving one of these theories.

A great variety of causes have been invoked, based largely on the theory that the disease was infectious. To broaden the working basis it was determined to study the prevalence of cancer among civilized and uncivilized races, to determine its prevalence among wild animals, to determine if the disease was transferable, to demonstrate that transferred cancer was similar to that which occurred in man, and to ascertain what animals were best suited to experimental work; and lastly, the statistical study of cancer distribution.

It is along these lines that the inquiry has been conducted, and while apparently the end is no nearer, many fallacies have been exposed and much has been done to broaden the investigation and place it on a sure foundation. The inquiry has shown that native uncivilized races suffer from cancer. Malignant new growths have been obtained from fishes and birds, both wild and domesticated. It has been demonstrated that cancer occurs in all vertebrates, with the possible exception of reptiles, but it is believed that these will yet be found, and there is a probability that it occurs among invertebrates. The histological structure of these growths is identical with those observed in man. In animals it has the same higher incidence in advanced age that it has in man.

In the unique features which attend the transmission of cancer are found the most striking contributions to the subject of malignant growths. It has been determined that habitat,

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Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

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food, and conditions of life play a relatively unimportant part in causing the disease. The increased prevalence of cancer in native races and domesticated animals is not due to association with civilized races but to the opportunity afforded of reaching the "cancer age." Old age is not requisite for the propagation of cancer, as the growths once inoculated will grow more rapidly in the young. The inoculated tumors have the same characters as the parent growth, and can only be inoculated into those of the same species. Mice so far are the only animals in which carcinoma has been propagated, and it is impossible to get mouse cancers to grow in other species of animals. It is with difficulty that tame mice are inoculated from wild mice, differences being noted between mice of the same species obtained from different localities. "The outstanding features in the artificial transmission of cancer are, therefore: (1) The great difficulty of transmission as contrasted with that of the known infective diseases; (2) the continued vitality of the cancer cells as opposed to the death of the stroma cells, and renewal of the stroma by the reaction set up in the tissues of the host at each reinoculation; (3) the cells descended from any one sporadic tumor, although apparently undifferentiated (embryonic), retain constant properties determining the specific nature of the stroma freshly supplied at each inoculation; (4) the importance of unsuspected subtle differences in different races of mice sufficient to determine success or failure, and, *per contra,* the unimportance of changes associated with age and other natural processes in the life cycle of the individuals of any one race when once cancerous growth has started; (5) the contrasts established between the transmission of cancer and all known processes of infection."

In the transmission of cancer the cells are transplanted and have the power of developing a new stroma, and they grow in a succession of animals. Jensen's tumor is growing to-day with undiminished energy four years after the death of the mouse in which it arose. The tissues of the new host do not acquire any cancerous properties; they only supply the new growth with nourishment. The process is fundamentally different from all known processes of infection. The investigators so far negative all previous explanations of cancer, including the infective as well as the embryonal theories. Artificial propagation does not solve the origin of cancer, but a continued study of experimental cancers may throw light on the measure of proliferation, relative growth, and process of natural decay, if any, in cancers. When these questions have been answered the old question, "What is the cause of cancer?" will be approached from a different standpoint, which may afford better results than the study of tumors obtained from human beings.

THE BILL TO IMPROVE THE MEDICAL DEPARTMENT OF THE ARMY.

The old injunction "In time of peace prepare for war" has received its strongest indorsement in the recent experience of Japan in the Manchurian campaign. At the close of the Chino-Japanese war the latter country realized that if it was to occupy a commanding position in the affairs of the East it would have to do battle with Russia. For ten years it set about studying campaigns, and it learned the lesson that the most destructive agency in dealing with armies in the field was disease. It set itself bravely to solving the problem of saving this enormous loss from preventable disease, and also of conserving the wounded. That it solved these problems better than they have ever been solved is now unquestioned. The figures are sufficiently striking. In fourteen months the deaths in the Japanese army

from wounds and casualties were approximately 52,000, while the total deaths from sickness amounted to about 12,000. Approximately one in four died of disease, nearly reversing the figures which obtained during the war of the Rebellion, when about one in four died from wounds inflicted by the enemy. The deplorable fiasco in the Spanish-American war, by which the ratio of deaths from disease was nearly fourteen to one resulting from injury, is hardly applicable as a comparison. In that war the battles were mere skirmishes, and it is obvious that if they had been still fewer in number the death-rate from disease would have presented a still higher proportion. Dismissing figures as being somewhat unreliable we can refer to the notorious breakdown of the medical service when the troops were assembled in the home camps, as well as the commissary and medical services when they were sent to Cuba. There is no reason to think that if a skirmish should occur with one of our neighbors, or if the unwelcome alternative of a great war should be forced upon this country, the disasters of the Spanish-American campaign would not be repeated. The medical service of the army is undermanned and needs reorganization. The last Congress had before it a bill which failed to pass, and the present Congress has before it Senate Bill No. 16, which provides for doing away with the present contract surgeon and enlisting him in the regular service. It increases the number of medical officers from 300 to 450. The bill has been indorsed by the various secretaries of war, by the President, and all those conversant with military medical affairs. It is to be hoped that the bill may be early put upon its passage. Medical men everywhere interested in this important branch of the public service should urge their congressmen to support the bill. It will put the medical corps on a better basis than it has ever been. The passage of this bill will depend largely upon the support given by the medical profession.

THE PURE FOOD BILL.

At the present writing it seems as if this much-needed legislation was destined to fail. The Pure Food Bill has been twice passed by the House of Representatives, and each time it has been killed by the Senate. The upper house has avoided a direct vote on the issues involved, but has by dilatory tactics managed to prevent the passage of the bill by holding it up until the crowded closing days, when it failed to pass. The inability of the sponsors to obtain unanimous consent for the bill to be put upon passage means that the Senate will not have to go on record. In a recent senatorial debate one of the speakers having lost himself inquired to what bill he was speaking, and was informed by a colleague that it was the Pure Food Bill, and he immediately steered his course toward the San Domingo imbroglio. This is a sample of the manner in which this vital bill is being treated by the Senate. It would seem as if this were a splendid opportunity for organized medicine. It would be easy for the committee on legislation, or in the absence of such a body for the officers of each State society, to ascertain the attitude of the senators from each State in reference to this particular bill. It would be of interest to know the attitude of the lawmakers in reference to public health measures.

The Chicago Health Bulletin, January 27, 1906, commenting on a recent address which contained the sensational statement that "thousands of persons instead of being nourished by what they eat are slowly done to death by it," says that one can hardly draw such a conclusion from the vital statistics of Chicago, which have shown a progressive lowering of

the death-rate until now there is nearly a gain of 100 per cent in the span of human life. Chicago's Health Bulletin is generally a conservative document, but this lugging in of food adulteration in relation to vital statistics is rather far-fetched. In the first place it is by no means certain that the mortality-rate of Chicago might not be lowered by an adequate and pure food supply. At the same time no one will believe that thousands are being slowly done to death by impure food, yet that is no good argument why dealers should sell ground cocoanut shells for coffee, yellow ochre for cinnamon, and a decoction of Cayenne pepper and wood alcohol for Jamaica ginger. The statistics of blindness due to the ingestion of wood alcohol are sufficiently appalling to call for stringent government regulation in the sale of adulterated alcoholic liquors. It is to be hoped that medical men everywhere will interest themselves in the pure food bill and do what they can to secure its passage.

THE DOSAGE OF DIPHTHERIA ANTITOXIN.

Some years ago we referred editorially to the English practice of administering large doses of antitoxin to patients presenting severe symptoms. The record of those cases was in many respects far more favorable than anything that had been up to that time reported from American hospitals. The dictum that antitoxin should be administered early has long been accepted, and the statistics of its use have shown that when given on the first or second day of the disease the mortality is rapidly diminished. *Per contra,* as the antitoxin is administered later the mortality rapidly rises. This has been claimed by English pediatrists to be due to the fact that in America too small doses of antitoxin were administered, and that many of these severe cases would recover providing large doses were given, from twenty to thirty thousand units, and repeated until the symptoms improved.

John Howland in an editorial (*Archives of Pediatrics,* January, 1906) argues earnestly for the use of diphtheria antitoxin in far larger doses than it is commonly used. He effectually disposes of the fear that diphtheria antitoxin has any untoward effects. He says the occasional unpleasant symptoms noted after its administration may be disregarded. The instances of sudden death that have followed the injection of antitoxin are no more frequent than they are after many trifling injuries that occur in individuals who are subject to the lymphatic diathesis. The sudden death of such individuals after the prick of a hypodermic needle or some other slight traumatism is difficult to explain, but there is no reason to attribute the deaths in such cases to antitoxin. The occasional muscular pain and skin eruptions may be disregarded. He approves of the working rule advocated by Holt that on the second day the dose should be twice that of the first for an equally severe condition, and on the third day three times. It is better to give a sufficient quantity to neutralize the toxin at one dose than to give it in divided doses. If it is necessary to give 20,000 units, it would be better to give it at once than to give 5000 units at four-hour intervals. The toxin that is unneutralized would remain in the circulation and inflict irreparable damage. For immunizing a child under two years, except in the very young, 500 units is the proper dose, and for a child over two years, including adults, the dose should be 1000 units. A mild early attack in a child less than two years of age (those of a few weeks still being excluded) is readily cured by 2500 to 4000 units, but the larger dose is safer. A similar attack in an older child should be met by the injection of 5000 to 6000 units. The young child suffering from a severe form of the dis-

ease should, if seen early in the attack, receive 5000 to 6000 units, the older child or adult 10,000 to 15,000 units. When seen late in the disease they should be given proportionately larger doses; in the neglected cases from 20,000 to 45,000 units. When the case is complicated by a pneumonia very large amounts of antitoxin should be given, from 25,000 to 50,000 units. In a considerable number of cases the Klebs-Loeffler bacillus is responsible for the pneumonia, and in such it will be followed by a prompt resolution. Pneumonias which develop after antitoxin has been given, which is especially true of laryngeal cases, are due to the streptococcus or pneumococcus, and are not influenced by the antitoxin treatment.

HYSTERIA IN THE OHIO LEGISLATURE.

The august Ohio legislature has allowed itself to be stampeded by a hysterical individual. It is difficult to say why a legislative body is spoken of as an august body in view of the fact that they are subject to hysterical attacks of such a marked type as the Ohio legislature has recently exhibited. In this particular instance the hysteria was not of autogenetic origin, but was supplied from an extraneous source, having had its origin in an address before one of the women's clubs of Cincinnati. The bill in question was passed by the lower house of the legislature, and proposes to legalize murder. It says that where one is afflicted with an incurable malady causing great pain and suffering he may at his own request summon a board of physicians, not less than four in number, who shall decide whether it is proper for him to be put away. If the decision is in the affirmative the individual is to be chloroformed, or life is to be taken in some other easy and painless fashion.

Euthanasia is a perennial topic of discussion. Generally it has been proposed for idiots, instinctive criminals, and the hopeless chronic insane. In this connection it may have an academic interest, though it cannot have any practical or moral standing. In relation to those affected with chronic and painful diseases which are necessarily fatal it can have no practical bearing. The resources at the command of the physician are now so ample that death can be made quite painless. The administration of morphine to those *in extremis* and who are suffering has long been looked upon by the laity as a means of shortening life. As a matter of fact the administration of remedies for the relief of pain tends to prolong life rather than shorten it. The skilful physician is almost invariably able to prolong the life of the incurable and to relieve pain. The passage of such a bill by the Ohio legislature is not only useless because it is of no value, but it is immoral and dangerous. It is not only an infraction of the ecclesiastical law, but is contrary to the statute of the common law, which says that "whoso shortens the life of a human being in the peace of the people is guilty of murder."

MEDICAL ORGANIZATION.

The gratifying news that harmony had been restored at last in the medical ranks of New York is sadly marred by a few notes of dissatisfaction arising in other parts of the country. The organization remedies which are necessary have been administered in Oregon, but so far they have failed to work. There seems to be a marked idiosyncrasy. The chief consultant has made a careful diagnosis, both clinical and pathological, and has prescribed the necessary remedies. But the patient has either refused to take them, or if taken they have acted in such an untoward manner that no good results are expected.

A similar but far less formidable failure in

organization has taken place in Burlington, which doughty little city in Iowa finds itself among the rank outsiders. They are neither members of the Iowa State Medical Society nor of the American Medical Association. It would seem as if they intended to go alone, and if they persist in this stiff-necked attitude the ultimate result will be that when we speak of the medical profession of the United States, meaning the organized part of it, we shall say "the profession of the United States, Oregon, and Burlington."

The causes which have led to the failure of organization in the two sections are unknown, but we do feel like admonishing the profession in these sections to be good and promptly come in and be organized. They will feel better after it is done. In our early days the sovereign remedy in the family was castor oil. To our youthful mind it was a remedy without a redeeming feature: offensive to the smell, nauseous to the taste, and revolting to the imagination. Maternal firmness summarily met these objections by holding the nose, which soon opened the mouth and a passageway to the stomach. All that we can say to the bolters, if such they are to be called, is that organization is a good thing. It will do you good, and if you will only take it you will feel better afterward.

DANGERS OF SCOPOLAMINE-MORPHINE ANESTHESIA.

A number of deaths reported as due to this method of producing anesthesia leads *Surgery, Gynecology and Obstetrics* for December, 1905, to discuss the question from an editorial standpoint. A number of leading surgeons have rejected this form of anesthesia altogether, and it may be a question how far one is justified in using it, in view of the fact that a considerable number of fatal cases have been reported. De Maurans collected twelve fatal cases early in the current year. It is possible that some of these cases were not directly traceable to this method of anesthesia, but, as the editorial points out, it is necessary for the advocates of this new procedure to meet these questions of reasonable doubt. Extensive degenerations of the parenchymatous organs have been noted, and Israel raises the question whether or not the combination of scopolamine and morphine with chloroform may not prove exceedingly toxic, far more so than either of these when given alone.

THE INTERNATIONAL MEDICAL CONGRESS.

The Congress will be held this year in Lisbon, beginning April 19. Like a number of recent congresses held in smaller European capitols, there will probably be considerable overcrowding. The better class hotels in Lisbon contain scarcely a thousand beds, so that the accommodations which can be placed at the command of visitors is necessarily limited.

It is possible that the number in attendance at the Congress will be much less than has obtained in recent years. The disadvantages of international medical congresses have been increasingly apparent, not the least of which is the positive discomfort due to the overcrowding and insufficient accommodations. The arrangements for reaching Lisbon are on the whole satisfactory. Direct steamers will leave New York, and those who care to go by the way of England will find a special ship sailing from Havre and another from Liverpool, both of which will reach the Congress in time for the opening day.

ORIGINAL ARTICLES.

CHANGES IN THE RETINA AND RETINAL VESSELS AS AN INDICATION OF LESIONS IN HEART AND BLOOD-VESSELS.[1]

BY THOMAS A. WOODRUFF, M.D., C.M., L.R.C.P.,
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Frequently the ophthalmologist is consulted by patients of middle life who have pronounced ocular symptoms, and who on examination show, besides a possible eye-strain, which is accountable for many of the local symptoms, signs and changes in the background of the eye itself, which are a part of certain morbid conditions of the general system, and can readily be recognized by the ophthalmoscope if a careful and diligent examination is made of the ocular fundus.

FIG. 1.—Representing the normal vascular supply of the retina.

The background of the eye is the only region of the body where blood-vessels, or more properly speaking the blood current, can be seen. The vascular walls are so thin that they are practically invisible in the normal state, and it is merely the column of blood as it circulates through its channels that is recognizable. Not until some decided change takes place in the vascular coats are the walls of the blood-vessels seen.

The retinal vessels possess no anastomoses, but are terminal vessels, and for this reason the region which depends for its nutrition upon these vessels is liable to show alterations in structure that are a reflection of wide-spread vascular degeneration.

The early recognition of these anomalies is important from a clinical standpoint. In many instances it is the first indication that vascular degenerative changes are taking place elsewhere, and those seen in the eye are only part of a morbid process existing in the blood and

[1]Read before the Chicago Medical Society.

blood-vessels of the brain, heart, kidneys, and other portions of the body.

With the ophthalmoscope many a commencing general vascular degeneration can be detected in its incipiency by noting the alterations in retina and retinal circulation. Little importance has been attached by the practitioner of medicine to fundus examinations for the early detection of vascular changes, although the ophthalmologist has for years known that in the background of the eye the first signs of capillary alterations show themselves. A man apparently in good health, exhibiting no symptoms of disease apart from a slight defect in vision, may be the subject of vascular changes of the most serious character. Patients with serious degenerations of this character not uncommonly consult the ophthalmic surgeon, without even suspecting that they are the subjects of a deadly disease which may go on for months, or even years, without setting up symptoms referable to other organs, and consequently without the family physician being consulted.

The internist should use the ophthalmoscope and familiarize himself with at least the normal appearance of the background of the eye. Half an hour now and then will after a few months' regular practice enable any observer to make himself competent to recognize at least the gross changes that sooner or later show themselves in the course of these diseases. Negative evidence is often quite as valuable as positive. Where no signs of capillary alterations are to be found in the retinal arteries, nor changes in the retina itself, the probability is that there are no advancing changes going on in the vessels elsewhere. It is by no means claimed that this is an infallible test, but it is among the most important of the early indications of general disease. When structural changes in this situation are found so slight that a most careful and diligent search is required for their detection, positive conclusions can be formed that these are only a part of a fibrosis more or less extensive in the arteries and capillaries throughout the whole system.

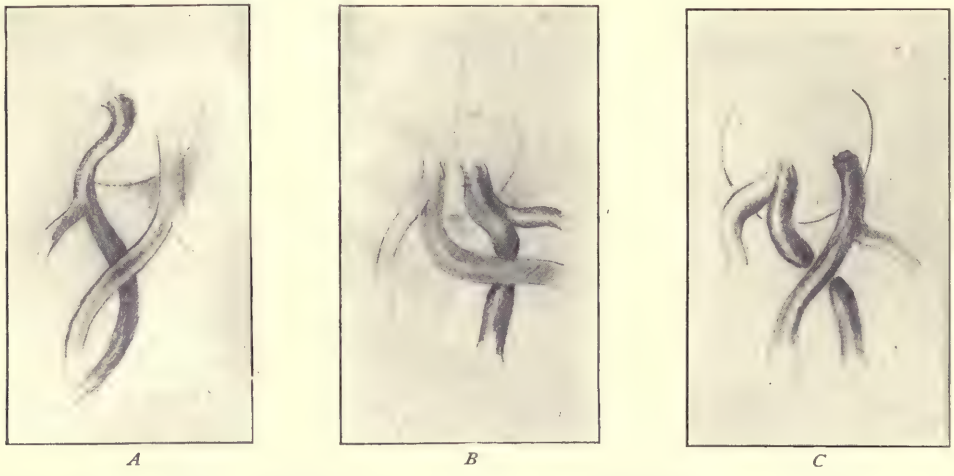

FIG. 2.—A diagrammatic representation of the appearance of a retinal vein where crossed by an artery. *A*, No pathological changes have taken place in the vascular coats; the underlying vein is dimly seen beneath the artery. *B*, Commencing arterial degeneration. Narrowing of vein at point of crossing showing slight obstruction of the venous circulation. *C*, Late stage of arteriosclerosis, showing marked obstruction of the venous circulation.

In the earliest stages of vascular degeneration certain changes visible with the ophthalmoscope may be seen in the background of the eye and about the vessels, and when present are conclusive evidence of similar alterations in the vessel walls elsewhere in the body.

Tortuosity of the retinal vessels, although

one of the earliest phenomena, is not in itself a positive sign unless confirmed by the presence of other variations from the normal which are generally to be found in the early stages of arterial degeneration. These are alterations in the caliber of the vessels showing inequalities in the width of the blood column at various points in their course. The localized contractions in some instances amount to almost total disappearance of the capillary, which then regains its normal size; this condition occurring over and over again, giving the vessels a bead-like appearance. At the same time the vascular reflex is broader and brighter, and whitish stripes run along the margin of the vessel wall. In the normal condition the walls of the retinal vessels are not visible with the ophthalmoscope, the width of the column of blood indicating in a general way the diameter of the vessel. But when the vessel walls become thickened from degenerative changes there occurs a loss of translucency, in which the arteries lose their power of transmitting light, where a vein is crossed by an artery. The vein becomes obscured at this point, and the phenomenon is usually accompanied by an appearance of compression and loss of the light streak in the vein on either side of the point of crossing. In the more advanced stages the vein is practically obliterated from the pressure exerted by the artery, and enlargement of the distal end of the venous current is quite apparent. On the other hand, when the vein crosses the artery it appears to hook over that vessel with less signs of compression of its coats.

Edema of the retina from interference with its nutrition occurs sooner or later and is recognized as a grayish haze, which is better seen in the macular region or along the course of the vessels.

FIG. 3.—The vascular changes as seen in arterial degeneration representing the impeded circulation (*A*) in the veins where crossed by an artery.

The relation of vascular disease to various morbid conditions in certain organs of the body is well known. The causes that lead up to these changes in the circulation depend upon the absorption into the blood of the toxins given off under diseased conditions in the general system, which, if not checked, have an effect upon the vascular coats that ultimately results in

pathological changes, which sooner or later become permanent and produce degenerations in various organs of the body. They are due to the retention in the system of effete substances which act as poisons, their existence depending upon defective action of the excretory organs.

If such excretory organs as the kidneys and liver act indifferently, there is an accumulation of the toxic matter absorbed into the blood-stream which produces morbid changes, not only in the vessels of these organs, but more particularly in the general vascular system. Primary arteriosclerosis depends in a great measure on just such a cause.

Arteriosclerosis, in the true sense of the term, is probably never of primary origin, but is secondary to a degeneration which has already existed for some length of time. The patients whose retinal vessels show these degenerative changes are generally those who have reached the age of forty or fifty years, who have led a sedentary life, and who are fond of good living. There is, also, a history in most instances of some form of "indigestion," and in many cases there is a distinct history of gout or "rheumatism." It is in such cases that the natural functions of the excretory organs are not carried on perfectly. A form of poisoning results from absorption into the blood of the effete matters, which are insufficiently eliminated.

Gout, syphilis, and alcoholism are associated with and frequently play an important rôle in the causation of these degenerations. Probably they are, in the majority of instances, the underlying cause of the arterial disease. What effect the poisons have upon the blood and the vessel wall is not clearly understood, but the changes cause a high blood-pressure from increased resistance to the blood-current in the peripheral vessels. This is followed by hypertrophy of the heart, and eventually atheromatous changes in the arteries. As the disease advances in the system and a general arteriosclerosis develops, changes in the retinal vessels may be regarded as merely a part of these vascular alterations that are at the same time taking place elsewhere in the body. These pathological changes may go on for years without giving rise to any untoward symptoms that have an effect upon the patient's ordinary mode of life. It is only when the disease has advanced to the stage in which foci of sclerosis appear in the kidneys, liver, and the larger vessels that notice is taken of them, or even a suspicion is entertained that the patient's life is in danger.

There is probably no other disease in which vascular sclerosis plays a more conspicuous part than atypical chronic gout, a disease characterized, among other changes, by high arterial tension and cardiac hypertrophy. The gouty diathesis predisposes to vascular degeneration of a more or less pronounced type, the presence of which is recognized in retinal changes confined more or less (especially in the early stages) to certain alterations in the retinal vessels and circulation, although these changes do not differ materially from those which are present in the course of arteriosclerosis due to other causes. It is well recognized that degeneration of the retinal vessels, and of the retina itself, is probably more indicative of chronic gout than any other morbid process. This is probably due to the presence of deleterious matter, which, producing changes in the blood and acting on the coats of the vessels, induces a high arterial tension that is responsible for the alterations in the arterial walls themselves. These same causes bring about sclerotic metamorphoses in the smaller blood-vessels and capillaries. These degenerative changes show themselves in the retina by alterations in the appearance of the blood-vessels, which, in the early stages, are so slight that they are easily overlooked if a careful examination is not made. The retinal

B. J. C.

arteries are diminished in caliber, with more or less tortuosity of the distal end of the vessel; the bright streak is broader and there is decided loss of translucency, so that the underlying vein at a point of crossing does not show itself through the artery but seems pressed upon almost to the point of obliteration. As the degeneration becomes more extensive, edema of the retina, even to the extent of interference with the visual power, develops. Later on, in the more advanced stages of the sclerosis, the vessels become engorged and tortuous; hemorrhages take place from the degenerated capillaries.

Hemorrhages into the retina not uncommonly occur at some stage of the disease, and are the result of a diapedesis or an actual rupture of the vessels from a weakened condition of the vessel wall, probably the result of changes in the composition of the blood and in the coats of the vessels. They are danger-signals which serve as suspect notices of the existence of general vascular disease, and a suitable systemic examination should follow.

Hemorrhages may be of any size, and vary from a minute point to a large extravasation covering the greater portion of the retina. In number there may be one or many, scattered over the fundus, situated either in the periphery or macular regions alone, or in both situations at the same time, in most cases following the course of the blood-vessels, and in many cases covering them. Their shape depends upon the position they occupy in the substance of the retina, being round, oval, or irregular when situated in the outer or inner layers, and striated or flame-shaped when in the nerve fiber layer of the retina. Sometimes the hemorrhage is situated between the retina and vitreous, usually in the neighborhood of the macular region, and it has a rounded, well-defined outline.

Recent bleedings are bright-red in color, which in a few cases are absorbed, but more often the bright-red color is replaced by the formation of whitish spots of degeneration, which in time usually become pigmented, and in many instances become replaced by masses of dense pigment.

Hemorrhages are situated usually in the neighborhood of the optic nerve head and the region of the macula, although they may be located in any portion of the fundus and arise either from the larger vessels or the capillaries, and take place in any of the layers of the retina or between the retina and vitreous. When situated in the nerve fiber layer their appearance is characteristic, being striated or flame-shaped, while in other situations they are round and irregular.

The presence of hemorrhages indicates a weakened condition of the vessel wall from a degeneration of retinal vessels accompanied by an increase in the arterial pressure, a condition which is likely to exist in cases of valvular disease of the heart, in morbid conditions of certain organs of the body, as in chronic Bright's disease, in general blood diseases such as gout, pernicious anemia, leucocythemia, etc., or in the degenerative changes seen in old age, and which are frequently a forerunner of similar changes existing in the brain, with eventual rupture of a vessel in that organ. Retinal hemorrhages nearly always accompany thrombosis and embolism of the retinal veins and arteries, conditions which frequently depend upon diseases of the heart, kidneys, or blood-vessels of the brain, and although occurring more often in elderly people, they are occasionally met with in persons under middle life, and may be the first warning of any existing disease in these organs.

In chronic Bright's disease retinal hemorrhages are probably more common than with pathological changes in other organs of the body. Although occurring in all forms of organic disease of the kidney, they are met with most frequently in the chronic variety, espe-

cially in granular kidney, a disease which is preceded by and depends for its existence largely upon a chronic endarteritis. In many cases it is not until the patient has been examined by the ophthalmic surgeon on account of some sudden or gradual loss of vision that the existence of the renal disease is known, although the latter has been present for some time. In some cases no albumin is present in the urine, or only a trace is found after repeated examinations, and the specific gravity is low. The hemorrhages are usually situated in the nerve fiber layer of the retina, and have neighborhood of the optic disk and macular region, a stellate arrangement of these spots about the macular region being characteristic of the disease. About ten per cent of the cases of renal and other affections in which albuminous urine is found are associated with retinal changes of one kind or another.

Prognosis.—The significance of these retinal changes and the influence they exert upon the life of the individual depend largely upon their cause and the progression of the degeneration in other portions of the body. The degenerative process, which so often has an

FIG. 4.—Representing the characteristic appearances of retinal degeneration (*A*) and the flame-shaped hemorrhages (*B*) that are sometimes seen in chronic Bright's disease.

a striated and flame-shaped appearance. When they occur in the other layers they are oval or round and irregular. These hemorrhages may undergo absorption, leaving pigmented areas or whitish spots of atrophy with pigmented borders. Both eyes are affected, although the changes may take place in one eye some time before they occur in the other. Changes in the retina from degeneration of the nerve fibers are usually noted about the same time as the hemorrhages, and consist in the appearance of yellowish-white spots in the insidious beginning, may have gone on for some time before any abnormalities in the ocular fundus are noticed. Not until gross lesions have shown themselves in the eye can we positively predict a fatal termination. The mere fact that such conditions exist in the retinal vessels does not warrant us in assuming that the disease is going to progress to such a stage as to affect the function of the kidneys and liver or to cause degenerative changes in the brain.

The course of arterial degeneration is usu-

ally slow, although exhibiting periods of exacerbation. The patient's ordinary occupation is very little interfered with. There are ordinarily no symptoms of any moment which point to an altered state of the general health. The patient lives his daily life unconscious of the existence of these phenomena, until some marked symptoms from the occurrence of actual hemorrhages, thrombosis of the retinal vessels, etc., show themselves, and the clinical aspect of the case becomes decidedly changed. When these vascular alterations are recognized and appropriate treatment is instituted early, the progress of the disease may be arrested and the patient's health remain good.

An unfavorable prognosis depends upon the state of the heart and other organs. When the degeneration has so far advanced that the vascular walls are impregnated with tissue that is foreign to them, and hemorrhages into the retina and obstructions in the circulation have occurred, then an arrest of the progress of the disease cannot be hoped for.

Hemorrhages from retinal vessels and capillaries in persons past middle life should always be looked upon with suspicion; they indicate some degeneration of the general vascular system.

If occurring in old people in whom the existence of an arteriosclerosis is to be suspected, they point to a possible attack of cerebral apoplexy which will likely prove fatal.

In chronic Bright's disease retinal hemorrhages and changes in the retina itself appear as late manifestations of the disease and point to extensive degeneration in the general circulatory apparatus and kidneys, the prognosis in such cases being more favorable than when such complications do not exist. The average duration of life after the appearance of retinal complications is about two years.

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EROTIC SYMBOLISM.*

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(*Concluded from February* Medicine.)

The desire to be trodden on may be fundamentally an erotic symbolism, closely approaching foot-fetishism, and such slight indications of masochism as appear may be merely a parasitic growth on the symbolism, a growth perhaps more suggested by the circumstances involved in the gratification of the abnormal desire than inherent in the innate impulse of the subject.

This is illustrated in the following case:

C. P., aged 38. Heredity good. Father a self-made man of great energy and ability; mother a woman of intellectual tastes. Both healthy and normal. Several children of the marriage, all sexually normal so far as is known. C. P. is the youngest of the family, and separated from the others by an interval of many years. He was a seven-months' child. He has a sensitive skin, like the rest of the family. He has always enjoyed good health and is active and vigorous, mentally and physically.

From the age of 9 or 10 to 14 he masturbated occasionally for the sake of physical relief, having discovered the act for himself. He was, however, quite innocent, and knew nothing of sexual matters, never having been initiated either by servants or by other boys.

"When I encounter a woman who very strongly attracts me and whom I very greatly

*Read before the Chicago Academy of Medicine, Nov. 17, 1905.

admire," he writes, "my desire is never that I may have sexual connection with her in the ordinary sense, but that I may lie down upon the floor on my back and be trampled upon by her. This curious desire is seldom present unless the object of my admiration is really a lady, and of fine proportions. She must be richly dressed, preferably in an evening gown, and wear dainty high-heeled slippers, either quite open, so as to show the curve of the instep, or with only one strap or 'bar' across. The skirts should be raised sufficiently to afford me the pleasure of seeing her feet and a liberal amount of ankle, but in no case above the knee, or the effect is greatly reduced. Although I often greatly admire a woman's intellect and even person, sexually no other part of her has any serious attraction for me except the leg, from the knee downward, and the foot, and they must be exquisitely clothed. Given this condition my desire amounts to a wish to gratify my sexual sense by contact with the (to me) attractive part of the woman. Comparatively few women have a leg or foot sufficiently beautiful to my mind to excite any serious or compelling desire, but when this is so or I suspect it I am willing to expend any time or trouble to get her to tread upon me, and am anxious to be trampled on with the greatest severity. The treading should be inflicted for a few minutes all over the chest, abdomen, and groin, and lastly on the penis, which is of course lying along the belly in a violent state of erection, and consequently too hard for the treading to damage it. I also enjoy being nearly strangled by a woman's foot.

"If the lady finally stands facing my head and places her slipper upon my penis so that the high heel falls about where the penis leaves the scrotum, the sole covering most of the rest of it, and with the other foot upon the abdomen, into which I can *see* as well as feel it sink as she shifts her weight from one foot to the other, orgasm takes places almost at once. Emission under these conditions is to me an agony of delight, during which practically the lady's whole weight should rest upon the penis.

"One reason for my special pleasure in this method seems to be that first the heel and afterward the sole of the slipper as it treads upon the penis greatly check the passage of the semen, and consequently the pleasure is considerably prolonged. There is also a curious mental side to the affair. I love to imagine that the lady who is treading upon me is my mistress and I her slave, and that she is doing it to punish me for some fault, or to give *herself* (not me) pleasure.

"It follows that the greater the contempt and severity with which I am 'punished,' the greater becomes my pleasure! The idea of 'punishment' or 'slavery' is seldom aroused except when I have great difficulty in accomplishing my desire, and the treader is more than usually handsome and heavy and the trampling mercilessly inflicted. I have been trampled so long and so mercilessly several times that I have flinched each time the slipper pressed its way into my aching body, and have been black and blue for days afterward! I take the greatest interest in leading ladies on to do this for me where I think I will not offend, and have been surprisingly successful. I must have lain beneath the feet of quite a hundred women, many of them of good social position, who would never dream of permitting any ordinary sexual intercourse, but who have been so interested or amused by the idea as to do it for me—many of them over and over again. It is perhaps needless to say that none of my own or the ladies' clothing is ever removed, or disarranged, for the accomplishment of orgasm in this manner. After a long and varied experience I may say that my favorite weight is 10 to 11 stone, and that

black, very high-heeled slippers, in combination with tan silk stockings, seem to give me the greatest pleasure and create in me the strongest desires.

"Boots, or outdoor shoes, do not attract me to anything like the same degree, although I have, upon several occasions, enjoyed myself fairly well by their use. Nude women repel me, and I find no pleasure in seeing a woman in tights. I am not averse to normal coitus, and occasionally employ it. To me, however, the pleasure is far inferior to that of being trampled upon. I also derive keen pleasure—and usually have a strong erection—from seeing a woman, dressed as I have described, tread upon anything which yields under her foot, such as the seat of a carriage, the cushions of a punt, a footstool, etc., and I enjoy seeing her crush flowers by treading upon them. I have often strolled along in the wake of some handsome lady at a picnic or garden party, for the pleasure of seeing the grass upon which she has trodden rise slowly again after her foot has pressed it. I delight also to see a carriage sway under a woman—anything which needs the pressure of the foot.

"As to the origin of these feelings: When a lad of 14 or so I stayed a good deal at the house of some intimate friends of my parents. The daughter of the house, an only child, a beautiful and powerful girl, about six years my senior, was my special chum. This girl was always daintily dressed, and having most lovely feet and ankles, not unnaturally knew it. Whenever possible she dressed so as to show off their beauty to the best advantage—rather short skirts and usually little high-heeled slippers—and was not averse to showing them in a most distractingly coquettish manner. She seemed to have a passion for treading upon things which would scrunch or yield under her foot, such as flowers, little windfallen apples and pears, acorns, etc., or heaps of hay, straw, or cut grass. As we wandered about the gardens—for we were left to do exactly as we liked—I got quite accustomed to seeing her hunt out and tread upon such things, and used to chaff her about it. At that time I was, as I am still, fond of lying at full length on a thick hearth-rug before a good fire. One evening as I was lying in this way, and we were alone, A. crossed the room to reach a bangle from the mantelpiece. Instead of reaching over me, she playfully stepped upon my body, saying that she would show me how the hay and straw felt. Naturally I fell in with the joke and laughed. After standing upon me a few moments she raised her skirt slightly, and holding on to the mantelpiece for support stretched out one dainty foot in its brown silk stocking and high-heeled slipper to the blaze to warm, while looking down and laughing at my scarlet, excited face. She was a perfectly frank and charming girl, and I feel pretty certain that although she evidently enjoyed my excitement and the feeling of my body yielding under her feet, she did not on this first occasion clearly understand my condition; nor can I remember that, though the desire for sexual gratification drove me nearly mad, it appeared to awaken in her any reciprocal feeling. I took hold of her raised foot, and after kissing it guided it by an absolutely irresistible impulse on to my penis, which was as hard as wood and seemed almost bursting. Almost at the moment that her weight was thrown upon it orgasm took place for the first time in my life, thoroughly and effectively. No description can give any idea of what I felt—I only know that from that moment my distorted sexual focus was fixed for ever. Numberless times, after that evening, I felt the weight of her dainty slippers, and nothing will ever cause the memory of the pleasure she thus gave me to fade. I know that A. came to enjoy treading upon me, as

much as I enjoyed having her do it. She had a liberal dress allowance, and seeing the pleasure they gave me she was always buying pretty stockings and ravishing slippers with the highest and most slender Louis heels she could find, and would show them to me with the greatest glee, urging me to lie down that she might try them on me! She confessed that she loved to see and feel them sink into my body as she trod upon me, and enjoyed the crunch of the muscles under the heel as she moved about. After some minutes of this I always guided her slipper onto my penis, and she would tread carefully, but with her whole weight—probably about 9 stone—and watch me with flashing eyes, flushed cheeks, and quivering lips, as she felt, as she must have done plainly, the throbbing and swelling of my penis under her foot as emission took place. I have not the smallest doubt that orgasm took place simultaneously with her, though we never at any time spoke openly of it. This went on for several years on almost every favorable opportunity we had, and after a month or two of separation sometimes four or five times during a single day. Several times during A.'s absence I masturbated by getting her slipper and pressing it with all my strength against the penis while imagining that she was treading upon me. The pleasure was of course very inferior to her attentions. There was never at any time between us any question of normal coitus; both were well content to let things drift as they were.

"A little after 20 I went abroad, and on my return about three years later I found her married. Although we met often the subject was never alluded to, though we remained firm friends. I confess I often, when I could do so without being seen, looked longingly at her feet, and would have gladly accepted the pleasure she could have given me by an occasional resumption of our strange practice; but it never came.

"I went abroad again. Neither she nor her husband are alive; they had no issue. From time to time I have had occasional relations with prostitutes, but always in this manner, though I much prefer to find some lady of or above my own social position who will do the treading for me. This is, however, increasingly difficult.

"Out of, say, a hundred women (which at home and abroad is what I should estimate must have stood upon my body) I should say quite eighty to eighty-five were *not* prostitutes. Certainly not more than ten to twelve shared any *sexual* excitement, but while they were evidently excited they were not gratified. A. alone, so far as I know, had complete sexual satisfaction out of it. I have never asked a woman in so many words to tread upon me for the purpose of gratifying my sexual desires (prostitutes excepted), but have always tempted them to do it in a jocular or teasing manner, and it is very doubtful if more than a few (married) women really understood even after they had given me the extreme pleasure that they had done so, because any flushing and movement on my part under their feet were not unnaturally put down to the trampling to which they were subjecting me, and it was easy for me to guide the foot as often as was necessary on to the penis till orgasm took place, and even to keep it there, by laying hold of the other one to kiss it or on some other pretext, during emission. Of course many understood after once doing it (most only have done it once) what I was at, and although they did not ever discuss it, nor did I, they were not unwilling to give me as many treadings as I cared to playfully suggest. I don't think they got any pleasure sexually out of it themselves, though they could see plainly that I did, and they did not object to give it me. I have spent as long as twelve months with some women, working gradually nearer and nearer to my desire—

often getting what I wanted in the end, but more often failing. I *never* risk it till I am certain it would be safe to ask it, and have never had a serious rebuff. In very many cases I should say the doing of what I want has simply been regarded by the woman as gratifying a silly and perhaps amusing whim, and in which beyond the novelty of treading on a man's body she has taken but little interest.

"As in normal seduction, the endeavor to win the woman over to do what I want without arousing her antagonism is a great part of the charm to me; and naturally the better her social position the more difficult this becomes—and the more attractive. I have found that in three instances prostitutes have performed the same office for other men, and knew all about it. It is not uninteresting to note that these three women were all of fine, massive build—one standing about 5 feet 10 inches and weighing nearly 14 stone—but with comparatively uninteresting faces. The weight, build, and clothing count for a good deal in exciting me. I find that a sudden check to a man at the supreme moment of sexual pleasure tends to heighten and prolong the pleasure. My physical satisfaction is due to the fact that by getting the lady to stand with all her weight upon my penis (as it lies between her foot and the soft bed of my own body, into which it is deeply pressed) the act of emission is enormously prolonged, with corresponding enjoyment. For this reason also I prefer a very high-heeled slipper. The seminal fluid has to be forced past two separate obstacles—the pressure of the heel close at the root of the penis, and afterward the ball of the foot which compresses the outer half, leaving a free portion between them under the arched sole of the slipper. For the same reasons this pleasure is greatly increased by the retention of the urine, and I always try to retain as much water as I dare. The weight, build, and clothing count for a good deal in exciting the desire to feel the woman I admire tread upon me. Strange as it may seem, although pain and bruising are often inflicted by a severe treading, I have never been in any way injured by the practice, and my pleasure in it seems not to diminish by constant repetition. The comparative difficulty of obtaining the pleasure from just the woman I want has a never-ending, if inexplicable, charm for me."

It will be observed that in this case special importance is attached to shoes with high heels, and the subject considers that the pressure of such shoes is for mechanical reasons most favorable for procuring ejaculation. Nearly all heterosexual shoe-fetishists seem, however, to be equally attracted by high heels. Restif de la Bretonne[38] frequently referred to this point, and he gave a number of reasons for the attractiveness of high heels: (1) they are unlike men's boots, and therefore have a sexual fascination; (2) they make the leg and foot look more charming; (3) they give a less bold and more sylph-like character to the walk; (4) they keep the feet clean. It is doubtless the first reason—the fact that high heels are a kind of secondary sexual character—which is most generally potent in this attraction.

The foregoing history, while it very distinctly brings before us a case of erotic symbolism, is not strictly an example of shoe-fetishism. The symbolism is more complex. The focus of beauty in a desirable woman is transferred and concentrated in the region below the knee; in that sense we have foot-fetishism. But the act of coitus itself is also symbolically transferred. Not only has the foot become the symbol of the vulva, but trampling has become the symbol of coitus; intercourse takes place symbolically *per pedem*. It is a result of this symbolization of the foot and of trampling that all acts of tread-

ing take on a new and symbolical sexual charm. The element of masochism—of pleasure in being a woman's slave—is a parasitic growth; that is to say, it is not founded in the subject's constitution, but chances to have found a favorable soil in the special circumstances under which his sexual life developed. It remains an unimportant and merely occasional element.

It may be instructive to bring forward for comparison a case in which symbolism occurs involving boot-fetishism, but extending beyond it. In this case there is a basis of inversion (as is not infrequent in erotic symbolisms), but from the present point of view the psychological significance of the case remains the same.

A. N., aged 29, unmarried, healthy though not robust, and without any known hereditary taint. Has followed various avocations without taking great interest in them, but has shown some literary ability.

"I am an Englishman," he states, "the third of three children. At birth my father was 41 and my mother 34. My mother died of cancer when I was 15. My father is still alive, a reserved man, who still nurses his sorrow for his wife's death. I have no reason to believe my parents anything but normal and useful members of society. My sister is normal and happily married. My brother I have reason to believe to be an invert.

"A horoscope cast for me describes me in a way I think correct, and so do my friends: 'A mild, obliging, gentle, amiable person, with many fine traits of character; timid in nature, fond of society, loving peace and quietude, delighting in warm and close friendships. There is much that is firm, steadfast, and industrious, some self-love, a good deal of diplomacy, a little that is subtle, or what is called finesse. You are reserved with those you dislike. There is a serious and sad side to your character; you are very thoughtful and contemplative when in these moods. But you are not pessimistic. You have superior abilities, for they are intuitively intellectual. There is a cold reticence which restrains generous impulses and which inclines to acquisitiveness; it will make you deliberate, inventive, adding self-esteem, some vanity.'

"At an early age I was left much alone in the nursery, and there contracted the habit of masturbation long before the age of puberty. I use the word 'masturbation' for want of a better, though it may not quite describe my case. I have never used my hand to the penis. As far back as I can remember I have had what a Frenchman has described as 'le fetichisme de la chaussure,' and in those early days, before I was 6 years old, I would put on my father's boots, taken from a cupboard at hand, and then tying or strapping my legs together would produce an erection, and all the pleasureable feelings experienced, I suppose, by means of masturbation. I always did this secretly, but couldn't tell why. I continued this practice on and off all my boyhood and youth. When I discovered the first emission I was much surprised. I always did this thing without loosening my trousers. As to how these feelings arose I am totally unable to say. I can't remember being without such feelings, and they seem to me perfectly normal. The sight, or even thought, of high boots, or leggings, especially if well polished or in patent leather, would set all my sexual passions aflame, and does yet. As a boy my great desire was to wear these things. A soldier in boots and spurs, a groom in tops, or even an errand-boy in patent leather leggings fascinated me, and to this day, despite reason and everything else. The sight of such things produced an erection. An emission I could always produce by tightly tying my legs together, but only when wearing boots, and

preferably leggings, which when I had pocket money I bought for this purpose. (At the present moment I have five pairs in the house and two pairs of high boots, quite unjustified by ordinary use.) This habit I lapse into yet at times. The smell of leather affects me, but I never know how far this may be due to association with boots; the smell suggests the image. Restraint by a leather strap is more exciting than by cords. Erotic dreams always take the form of restraint on the limbs when booted.

"Uniforms and liveries have a great temptation for me, but only when of a tight-fitting nature, and smart, as soldiers, grooms, etc., but not sailors, most powerfully when the person is in boots or leggings and breeches.

"I was a quiet, sensitive boy. Took no part in games or sports; have always been indifferent to them. I made few friends, but didn't want them. The craving for friendship came much later, after I was 21. I was a day boy at a private school, and never had any conversation with any boy on sexual matters, though I was dimly aware of much 'nastiness' about the school. I knew nothing of sodomy. But all these things were repulsive to me, notwithstanding my secret practices. I was a 'good boy.'

"Up to the age of 21 I was perfectly satisfied with my own society, something of a prig, fond of books and reading, etc. I was and ever have been absolutely insensible to the influence of the other sex. I am not a woman-hater, and take intellectual pleasure in the society of certain ladies, but they are nearly all much older than myself. I have a strong repulsion from sexual relations with women. I should not mind being married for the sake of companionship and for the sake of having boys of my own. But the sexual act would frighten me. I could not in my present frame of mind go to bed with a woman. Yet I feel an immense envy of my married friends in that they are able to give out and find satisfaction for their affection in a way that is quite impossible for me. I picture certain boys in the place of the wife.

"I am now only happy in the society of men younger than myself, age 17 to (say) 23 or 24—youths with smooth faces, or first sign of hair on lip, well groomed, slightly effeminate in feature, of sympathetic, perhaps weak nature. I feel I want to help them, do something for them, devote myself entirely to their welfare.

"With such there is no fixed line between friendship and love. I yearn for intimacy with particular friends, but never dare express it. I find so many people object to any strong expression of feeling that I dare not run the risk of appearing ridiculous in the eyes of these desired intimates.

"I have no desire for *pædicatio,* but the idea in itself does not repulse me or seem unnatural, though personally it repels me a little. But I think this to be mere prejudice on my part, which might be broken down if the loved person showed a willingness to act a passive part. I should never dare to make an advance, however.

"I am restrained by moral and religious considerations from making my real feelings known, and I feel I should sink in my own estimation if I gave way, though my natural desire is to do so. In the face of opportunities (not, I mean, of *pædicatio,* but of expression of excessive affection, etc.), or what might be such, I always fail to speak lest I should forfeit the esteem of the other person. I have a feeling of surprise when any one I like evinces a liking for me. I feel that those I love are immeasurably my superiors, though my reason may tell me it is not so. I would grovel at their feet, do anything, to win a smile from them, or to make them give me their company.

"Ordinary bodily contact with the boy I

love gives me the most exquisite pleasure, and I never lose an opportunity of bringing such contact about when it can be done naturally. I feel an immense desire to embrace, kiss, squeeze, etc., the person, to generally maul him, and say nice things—the kind of things a man usually says to a woman. A handshake, the mere presence of the person, make me happy and content.

"I can say with the Albanian: 'If I find myself in the presence of the beloved, I rest absorbed in gazing on him. Absent, I think of nought but him. If the beloved unexpectedly appears I fall into confusion. My heart beats faster. I have eyes and ears only for the beloved.'

"I feel that my capacity of affection is finer and more spiritual than that which commonly subsists between persons of different sexes. And so while trying to fight my instincts by religion, I find my natural feeling to be part of my religion, and its highest expression. In this sense I can speak from experience in my own case, and more especially in that of my brother, that what you have said about philanthropic activity resulting from repressed homosexuality is very true indeed. I can say with one of your female cases: 'Love is to me a religion. The very nature of my affection for my friends precludes the possibility of any element entering into it which is not absolutely pure and sacred.' I am, however, madly jealous. I want entire possession, and I can't bear for a moment that any one I do not care for should know the person I love.

"I am never attracted by men older than myself. The youths who attract me may be of any class, though preferably, I think, of a class a little lower than myself. I am not quite sure of this, however, as circumstances may have contributed more than deliberate choice to bring certain youths under my notice. Those who have exercised the most powerful influence on me have been an Oxford undergraduate, a barber's assistant, and a plumber's apprentice. Though naturally fond of intellectual society I do not ask for intellect in those I love. It goes for nothing. I always prefer their company to that of the most educated persons. This preference has alienated me to some extent from more refined and educated circles that formerly I was intimate with.

"I have been led entirely out of my old habits by association with younger friends, and now do things which before I should never have dreamed of doing. My thoughts now are always with certain youths, and if they speak of leaving the town, or in any way talk of a future that I cannot share, I suffer horrid sinkings of the heart and depression of spirits."

This case, while it concerns a person of quite different temperament, with a more innate predisposition to specific perversions, is yet in many respects analogous to the previous case. There is boot-fetishism; nothing is felt to be so attractive as the foot-gear, and there is also at the same time usually more than this: there is the attraction of repression and constraint developed into a sexual symbol. In C. P.'s case that symbolism arises from the experience of an abnormal heterosexual relationship; in A. N.'s case it is founded on autoerotic experiences; in both alike the entire symbolism has become irradiated and generalized.

In the two cases just brought forward occurs an erotic symbolism of act founded on, and closely associated with, an erotic symbolism of object. It may be instructive to bring forward another case in which no fetishistic feeling toward an object can be traced, but an erotic symbolism still clearly exists. In this case pain, even when self-inflicted, has acquired a symbolic value as a stimulus to tumescence, without any element of masochism. Such a case seems here to

indicate how the sexual attraction of pain is really a special case of the erotic symbolism with which we are here concerned.

A. W., aged 50, a writer and lecturer, physically and mentally energetic, and enjoying good health. He is, however, very emotional and of nervous temperament, but self-controlled. Though physically well developed the sexual organs are small. He is married to an attractive woman, to whom he is much attached, and has two healthy children. At ten or twelve years of age he had a frequent desire to be whipped, his parents never having struck him, and on one occasion he asked a brother to go with him to the closet to get him to whip him on the posterior; but on arrival he was too shy to make the request. He did not recognize the cause of these desires, knowing nothing of such things except from the misinformation of his schoolfellows' talk. As far as he can remember he was an entirely normal, healthy boy up to the age of about 15, when his attention was arrested by an advertisement of a quack medicine for the results of "youthful excesses."

Being a city boy he was unfamiliar with the coupling even of animals, had never had a conscious erection, and did not know of frictional excitement; experiment, however, resulted in an orgasm, and though believing that it was wicked, or at least weak and degrading, he indulged in masturbation at intervals, usually about six times a month, even up to the present.

He had an abnormally small opening in the prepuce, making the uncovering of the gland almost impossible. (At the age of about 37 he himself slit the prepuce by three or four cuts of a scissors at intervals of about ten days. This was followed by a marked increase in desires, especially as he shortly afterward learned the importance of local cleanliness.) While in college, at about the age of 19, he began to have nocturnal emissions occasionally, and once or twice a week when at stool. Alarmed by these he consulted a physician, who warned him of the danger, gave him bromide, and prescribed cold bathing of the parts, a hard, cool bed, but told him nothing of his own physiology. These stopped the emissions.

He never had connection with a woman till the age of about 25, and then only three times until his marriage at 30 years of age, being deterred partly by conscientious scruples, but more by shyness and convention and deriving very little pleasure from these instances. Even since marriage he has derived more pleasure from sexual excitement than from coitus, and can maintain erection for as long as two hours.

He has always been accustomed to torture himself in various ingenious ways, nearly always connected with sex. He would burn his skin deeply with red-hot wire in inconspicuous places. These and similar acts were generally followed by manual excitation nearly always brought to a climax.

He considers that he is attracted to refined and intellectual women. But he is without very ardent desires, having several times gone to bed with attractive women who stripped themselves naked, but without attempting any sexual intercourse with them. He became interested in the "Karezza"[39] theory, and has tried to practice it with his wife, but could never entirely control the emission.

He has hired a masseur to whip him as children are whipped with a heavy dog whip, which caused pleasureable excitement. During this time he had relations with his wife generally about once a week, without any great ecstacy. She was cold and sexually slow, owing to conventional sex repression and to an idea that the whole thing was "like animals," and to fear of child-bearing, usually necessitating the use of a cover or withdrawal. It was only eight years after their marriage that she desired and obtained a child. During these years he would often stick pins through his mammæ and tie them together by a string

round the pins drawn so short as to cause great pain, and then indulge himself in the sexual act. He used strong wooden clips with a tack fixed in them, so as to pierce and pinch the mammæ, and once he drove a pin entirely through the penis itself; then came orgasm by friction. He was never able to get an automatic emission in this way, though he often tried—not even by walking briskly during an erection.

In another class of cases a purely ideal symbolism may be present by means of a fetish which acts as a powerful stimulus without itself being felt to possess any attraction. A good illustration of this condition is furnished by a case which has been communicated to me by a medical correspondent in New Zealand.

The patient went out to South Africa as a trooper from New Zealand, throwing up a good position in an office to do so. He had never had trouble as regards coitus before going to South Africa. While in active service at the front he sustained a nasty fall from his horse, breaking his leg. He was unconscious for four days, and was then sent to Capetown. Here he rapidly recovered. His accustomed health returning, he started having what he terms "a good time." He repeatedly went to brothels. He was unable to have more than a temporary erection, but without ejaculation. While in company with a drunken trooper, the latter suggested that they perform coitus with only their boots and spurs on. My patient, also drunk, assented, and to his surprise could copulate without difficulty. He has repeatedly tried since to copulate without spurs, but is unable to do so; with the spurs he has no difficulty in obtaining the gratification he desires. His general health is good. His mother was an extremely nervous woman, and so is his sister. His father died when he was quite young. His only relation in the colony is a married sister, who seems in vigorous health.

Consideration of the cases here cited suffices to show that beyond fetishisms which find satisfaction in contemplation of a part of the body or a garment is a more subtle symbolism. The foot is a center of force, an agent for exerting pressure, and thus it furnishes a point of departure not alone for the merely static sexual fetish, but for a dynamic erotic symbolization. The energy of its movement becomes a substitute for the energy of the sexual organs themselves in coitus, and exerts the same kind of fascination. Then by a further irradiation and extension even these movements of the foot, or movements resembling them, become by association reflexly capable of exerting the same sexual charm. The young girl "who seemed to have a passion for treading upon things which would scrunch or yield under her foot" already possessed the germs of an erotic symbolism which, under the influence of circumstances in which she herself took an active part, developed into an adequate method of sexual gratification.* The youth who was her partner learnt, in the same way, to find an erotic symbolism in all the pressure reactions of attractive feminine feet, the swaying of a carriage beneath their weight, the crushing of the flowers on which they tread, the slow rising of the grass which they have pressed. Here occurs a symbolism altogether different from the fetishism which adores a definite object; it is a dynamic symbolism finding gratification in the spectacle of movements which ideally recall the fundamental rhythm and pressure reactions of the sexual process.

A very similar erotic symbolism is traceable in an absolutely normal form. The fascination

*Her actions suggest that there is often a latent sexual consciousness in regard to the feet in women, atavistic or pseudoatavistic, and corresponding to the sexual attraction which the feet formerly aroused, almost normally, in men. This is also suggested by the case, cited by Shufeldt,[40] of an unmarried woman, belonging to a family exhibiting in a high degree both erotic and neurotic traits, who had "a certain uncontrollable fascination for shoes. She delights in new shoes, and changes her shoes all day long at regular intervals of three hours each. She keeps this row of shoes out in plain sight in her apartment."

of clothes in the lover's eyes is no doubt a complex phenomenon, but in part it rests on the aptitude of a woman's garments to express vaguely a dynamic symbolism which must always remain indefinite and elusive, and on that account always possess fascination. No one so acutely described this symbolism as Herrick, often an admirable psychologist in matters of sexual attractiveness. Especially instructive in this respect are his poems "Delight in Disorder," "Upon Julia's Clothes," and notably "Julia's Petticoat." "A sweet disorder in the dress," he tells us, "kindles in clothes a wantonness;" it is not on the garment itself but on the character of its movement that he insists, on the "erring lace," the "winning wave" of the "tempestuous petticoat;" he speaks of the "liquefaction" of clothes, their "brave vibration each way free;" and of Julia's petticoat he remarks with a more specific symbolism still:

> Sometimes 'twould pant and sigh and heave,
> As if to stir it scarce had leave;
> But having got it, thereupon,
> 'Twould make a brave expansion.

In the play of the beloved woman's garment he sees the whole process of the central act of sex, with its repressions and expansions, and at the sight is himself ready to "fall into a swoon."

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CHEMICAL AND MICROSCOPICAL STUDY OF URINE DURING LIFE FOLLOWED BY HISTOLOGICAL EXAMINATION OF THE KIDNEYS OF THE SAME PATIENTS.[1]

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[From the Laboratories of the Jefferson Medical College, Philadelphia, and from the Philadelphia Hospital.]

Having found casts and albumin in urine excreted by the kidneys of individuals whom I was told presented no clinical evidence of a kidney lesion, I concluded to determine whether casts and albumin are not found in urine excreted by organs which present little or no evidence of nephritis at post-mortem. Accordingly I began routine urinalysis of patients at the Philadelphia Hospital. At first I selected only such cases as were likely to come to autopsy soon, but upon careful consideration it occurred to me that perhaps such patients would not give the desired information, since decided changes might occur in the urine and the kidneys during the last few days of life. Cases were then selected indiscriminately and chances of their coming to autopsy assumed.

During the investigation the urine of 172 patients was examined. In 59 cases the urine was examined twice; in 91 it was examined once; in 16 three times; in 3 four times; in 3 five times. In all 284 examinations were made.

How albumin may be overlooked or be absent is illustrated by the analysis, which shows that in those cases in which the urine of the same patients was examined five times, albumin was demonstrated three times out of the five examinations in one case, and once out of the five times in two cases. Where the urine was examined four times, albumin was found at each test in but one case; in one patient it was present once out of four tests, and in another twice. Where the urine was examined three times in the same patient, albumin was present at each test in seven cases, twice out of three tests in four cases, and once in three cases.

[1]Read before the Pathological Society of Philadelphia, Nov. 23, 1905.

Of the 172 patients examined 16 came to autopsy.

Case 1.—The urine was examined once, but contained neither albumin nor casts; urea, 2.3 per cent. Death occurred seventeen days after the examination. Both kidneys were about normal in size; the capsules were not firmly adherent; the cortices were pale but normal in width. Death was due to ileocolitis. Microscopically the epithelial cells of many tubules were degenerated, necrotic, and desquamated. The capsule was slightly thickened, but the interstitial tissue was not greatly increased. While the condition was not marked, yet the microscopic picture revealed changes like those found in chronic diffuse nephritis.

Case 2.—The urine contained a trace of albumin; urea, 2.8 per cent; in the sediment were a few long hyaline casts. The patient died 1½ months after the urinalysis. The anatomic diagnosis was arteriosclerosis, cystitis, and chronic diffuse nephritis. The kidneys were smaller than normal; the capsule stripped off with some difficulty; the cortices were narrowed, especially near the poles. Microscopic sections showed a thickened capsule, an increase of the interstitial tissue of the cortex, particularly near the medulla. Many of the capsules of Bowman were thickened; in some of the tubules the epithelium was degenerated and necrotic, others contained hyalin plugs. From the microscopic changes observed these kidneys should be regarded as manifesting lesions of chronic diffuse nephritis.

Case 3.—The urine was examined but once; it contained no albumin, but a few long hyaline casts. Death resulted from tuberculosis of the lungs. The exact interval between the date of death and the urinalysis cannot be given, as the date of the latter was not recorded; it was about three weeks. The kidneys were normal in size; the capsule was drawn into the parenchyma at points; the width of the cortices was not much altered, but they contained pale areas. Microscopically the sections showed no thickening of the capsule, but a slight increase of the interstitial tissue. The epithelium in many of the tubules was swollen, granular, and degenerated. The microscopic picture of these kidneys is clearly that of chronic diffuse nephritis.

Case 4.—At the first examination the urine showed a trace of albumin; urea, 1.4 per cent. At the second examination the amount of albumin was greater; urea, 0.9 per cent. The second urinalysis was done forty-two days after the first, and death occurred two months after the last examination. The cause of death was tuberculosis of the lungs. Both hyaline and granular casts were found at each examination. The kidneys were reduced in size; the capsules were thickened; the surfaces of the organs were granular, and the cortices were narrowed. The renal vessels were markedly sclerotic. Microscopic examination revealed an increase of fibrous tissue in the cortex and a thickening of the capsule. Scattered throughout the sections were islands of hyalin substance; the same substance was occasionally found in the tubules and in large cyst-like cavities, where it was often disposed in concentric layers. When the amount of material in the tubules was small the epithelial cells were fairly well preserved. With all the methods employed the material selected the same stain as the substance forming the framework of hyaline casts. In the medullary portion the interstitial tissue presented myxomatous changes. The walls of the vessels were markedly thickened. Barring the myxomatous changes and the presence of hyalin substance, the picture is like that of chronic interstitial nephritis.

Case 5.—The urine showed albumin, 0.3 per cent; urea, 3 per cent; casts, hyaline, granular, and epithelial. Death occurred seven days after the examination from tuberculosis of the lungs. The kidneys were red at points

and yellowish-red in other places; the cortices were pale but not much altered in width. The microscope showed degeneration and necrosis of the epithelium; the condition involved most of the tubules. There were many tubercles in the sections; giant cells were found in the interstitial tissue. Hyalin substance like that in the sections of the preceding case was found, occasionally in cysts.

Case 6.—The urine: albumin, none; urea, 1.5 per cent; casts, none. There was but one examination; death occurred sixteen days after the urinalysis from tuberculosis of the lungs. The kidneys were normal in size but pale at some points; the cortices were about normal in width. The epithelium of many tubules was swollen and granular; the nuclei were either invisible or faintly visible; many were destroyed. The collecting tubules and the tufts were fairly well preserved. Diagnosis, chronic diffuse nephritis.

Case 7.—The urine: albumin, none; urea, 1.8 per cent; casts, none. The patient died two months after the urinalysis; the post-mortem diagnosis was aneurism of the aorta and arteriosclerosis. The kidneys were smaller than normal; they were firm and the capsules adherent; the cortices were narrowed at places. The interstitial tissue was greatly increased; the capsules of Bowman were thickened and many tufts were hyalin. In many of the tubules the epithelium was degenerated and necrotic. These changes were more advanced in some sections than in others. Hyalin substance was found in some of the tubules where the epithelium was necrotic but not in those where it was swollen. The walls of the vessels were thickened. This was a case of chronic interstitial nephritis of arteriosclerotic nature.

Case 8.—The urine: albumin, 0.25 per cent; casts, none. The sediment contained many polymorphonuclear leucocytes. The kidneys were large, pale; the capsules were not adherent; the cortices were wider than normal and showed grayish striations. In the pelves was considerable purulent substance. The patient died two weeks after the urinalysis. The epithelium of the tubules was swollen and necrotic; the medullary portion contained many polymorphonuclear leucocytes, and in some parts distinct abscesses. Death in this case was due to the septic condition incident to the suppurating cystitis, pyelitis, and nephritis.

Case 9.—The urine: first examination, albumin 0.2 per cent, casts hyaline; second examination, albumin 0.2 per cent, casts none. The patient died three weeks after the urinalysis from cerebral softening, arteriosclerosis, and suppurating endometritis. The kidneys were reduced in size; the capsules were adherent and thickened; the cortex of the kidneys was narrower at points. The renal vessels were sclerotic. The interstitial tissue was increased; some of the Malpighian bodies were hyalin, and the epithelial cells in many of the tubules were degenerated. Here the lesion was obviously chronic interstitial nephritis.

Case 10.—The urine: albumin, trace; casts, none. The patient died two weeks after the urinalysis from carcinoma of the head of the pancreas, with involvement of the biliary passages and the liver. The kidneys were nearly normal in size; the capsules were slightly adherent; the cortices showed no macroscopic alterations. Sections revealed an increase in the thickness of the capsule and advanced interstitial changes. The epithelium of many of the tubules was granular; the collecting tubules and the loops of Henle contained granular detritus. Diagnosis, chronic interstitial nephritis.

Case 11.—The urine was examined once early in the course of the disease; it showed no albumin nor casts; urea, 1.8 per cent. The patient died nineteen days after the urinalysis. At post-mortem the ileum contained an ulcer possessing all the characters of the local lesion

of typhoid fever; there was also gangrene of the gums and the upper lip, and catarrhal pneumonia. The bacillus typhosus was isolated from the spleen and the liver. The kidneys were large, deeply injected; the cortices were swollen; and the cut surfaces dripped blood and presented red striations. The epithelium of the convoluted tubules was swollen and granular, the nuclei were scarcely visible; many of the tufts were engorged. I believe the acute nephritis in this case developed as a part of the typhoidal condition and after the urinalysis was performed.

Case 12.—The urine: albumin, trace; casts, none. The patient died four days after the examination of the urine; death was due to carcinoma of the stomach with metastasis to the liver. The kidneys were increased in size; they were reddish-purple, and the cut surfaces dripped blood; the capsules were adherent. Sections revealed an increase of the interstitial tissue, thickened capsules, and some hyalin tufts. Some of the epithelium of the convoluted tubules was degenerated. Diagnosis, chronic interstitial nephritis and congestion of the kidneys.

Case 13.—Two examinations were made in this case. Albumin, none; casts, none; urea, first examination, 1 per cent, second examination, 2.5 per cent. The patient died two months after the last examination from tuberculosis of the lungs. The kidneys were decreased in size; the capsules were adherent; the cortices were pale, but not much altered in width. The microscope showed the most marked changes in the tubules where the epithelial cells were necrotic and fragmented. These changes were more advanced and more extensive in some sections than in others. The interstitial tissue was increased, and it contained collections of lymphoid cells here and there. Some of the Malpighian tufts were hyalin, and few of the blood-vessels contained hyalin thrombi. The most conspicuous changes in these organs were tubular, and were of chronic nature.

Case 14.—Here two examinations were made: (1) Albumin, decided trace; casts, hyaline and granular. (2) Albumin, decided trace; urea, 1.8 per cent; casts, hyaline and granular. The second examination was made one month after the first, and death occurred six days after the last urinalysis from tuberculosis of the lungs and tuberculous ulceration of the intestine. The kidneys were large and pale; the cortices were pale, swollen, and presented grayish striations. The epithelial cells were swollen and granular; the nuclei were degenerated. Occasionally the swollen epithelial cells contained small hyalin bodies, some of which were smaller and others were larger than red blood cells. When the cells disintegrated the bodies were free in the tubules. Many tubules contained compact hyalin substance. The interstitial tissue was markedly increased and was abundantly infiltrated with mononuclear cells. Sections fixed in osmic acid showed no fat in the epithelial cells. While these organs at the time of the examination were large, white kidneys, it is reasonable to assume that had the condition progressed for some time they would have eventually become the small, white type as indicated by the presence of the formative tissue.

Case 15.—The urine: albumin, 3 per cent; casts, granular and hyaline; red blood cells, few. Death occurred three days after the examination from carcinoma of the head of the pancreas with metastasis to the liver and the lungs. The kidneys were increased in size; they were bright-red in color; the capsules were adherent, and the cortices were swollen and dripped blood. The epithelial cells were swollen, granular, and desquamated; the vessels were engorged, and the interstitial tissue was increased. Diagnosis, acute parenchymatous superimposed upon a chronic interstitial nephritis.

Case 16.—The urine: albumin, trace; casts, hyaline. The patient died two weeks after the urinalysis from carcinoma of the stomach with metastasis to the liver. The kidneys were normal in size; the capsules were slightly thickened and adherent; the cortices presented pale areas here and there. The epithelium was necrotic and desquamated; the interstitial tissue was increased, but not markedly. Diagnosis, chronic diffuse nephritis.

An analysis shows that in four cases the urine contained neither albumin nor casts, but the kidneys of these cases presented marked degeneration and desquamation of the epithelial cells of the tubules. The question at once arises: Did the changes found in these kidneys occur during the later stages of life, or was the urine examination insufficient to say positively that it was albumin-free at all times? In all but one of these cases the urine was examined once. Had the urinalysis been performed oftener perhaps the albumin would have been demonstrated. This view is supported by the fact that in those cases in which the urine was examined three, four, and five times, albumin was sometimes demonstrated, but sometimes it was absent. This argument is supported by the findings of Case 3, in which albumin was absent, but casts were present, and the kidneys showed a chronic diffuse nephritis.

These results seem to corroborate the findings of Cabot (*Journal of the American Medical Association,* March 18 and 25, 1905), but I am not willing to draw conclusions that urinary examinations are untrustworthy in the acute and chronic diffuse forms of nephritis, for I believe the number of cases is entirely too small and the examination of urine not sufficiently thorough to justify it. I can scarcely believe that all the changes observed in the kidneys which secreted urine apparently free from albumin occurred during the terminal period, since the changes were sometimes as extensive as those seen in the kidneys which secreted albuminous urine.

In conclusion I wish to express my thanks for the valuable assistance given me by Mr. Widdowson and Mr. Funk, research students of the Jefferson Medical College, and also my indebtedness to the internes, chiefs, and nurses of the Philadelphia Hospital, who lent valuable aid.

TYPHOID FEVER AND ITS TREATMENT.[1]

BY LOUIS FAUGERES BISHOP, A.M., M.D., NEW YORK.

We will take for our subject to-day typhoid fever and its treatment. We have two typical cases of typhoid fever and one case which is unusual under our care to-day. I will take advantage of these cases to talk to you about the cases themselves and the general question of the treatment of typhoid fever.

Case 1.—This man, H. H., is 19 years old. He is a native of Finland, and a carpenter by occupation. On admission he said that he had been sick for one week with headache and nosebleed. The headache was very severe, and he was unable to take any food on account of lack of appetite. He was very weak and uncomfortable and could not sleep. He suffered from constipation, but he had no cough or expectoration. His chief complaint when he came was the headache and the malaise. Malaise is a word which is used to express the general aches and discomforts that people usually feel when they are being taken down with some acute disease. On admission his temperature was 104.5°; during the next five days it ran on an average of about 103°, and for the past three days it has been very near 102°

[1] A clinical lecture at the Lincoln Hospital, Dec. 13, 1905.

all the time. His pulse has been under 100 practically all the time. He has been treated with tub baths, and the disease has run a mild course. The physical examination showed nothing of importance, but during these past eight days he has developed a typical typhoid fever eruption, and his spleen has become enlarged so that it can be felt.

Case 2.—A man 30 years of age, a native of the United States; driver by occupation. He was taken sick about eight days ago with general pains and loss of appetite. He had a severe headache, but no nosebleed, and had some fever. He too was constipated. He suffered from sleeplessness, restlessness, and malaise. During this time he has been treated by a physician who made a diagnosis of typhoid fever, and his blood showed the typical Widal reaction. On admission his temperature was 102°, his pulse was 80; his general appearance is not that of a very sick man. We can feel his spleen when we make him breathe freely, and he has a typical typhoid eruption.

Case 3.—A woman 28 years old, a native of Norway; is married, and is a domestic by occupation. For the past few weeks she had pain in the back and chest, and headache. She has been nervous and sleepless like the other two patients, but about twenty-four hours before she was brought in she became actively delirious, and developed an acute mania. On admission her temperature was 99°, her pulse 60, respirations 22. The temperature gradually went up during the next twelve hours to 103°. This temperature on admission was probably an accidental fall in some way connected with the moving of the patient. Since the temperature increased it has remained at an average of about 103°, going at times as high as 104.5°. Her pulse has remained on the average below 100. On physical examination on admission she did not show anything particularly characteristic, but to-day she has a very abundant typhoid fever eruption, and her spleen is palpable. Her delirium is of a "busy" type, she constantly worries about something, or asks about something, and her mind is running away as if the brake was taken off an engine; but she is much less delirious than when she first came in, and with the cold-bath treatment in a day or two she may be like the other two patients. The cold-bath treatment is particularly advantageous in cases like this. I have seen a patient much more delirious than she completely calmed by prolonged cold baths. She presents an extraordinary condition, which is met with once in a while in typhoid fever—that is, a very wild and active delirium occurring at the onset of the disease. I do not know how to explain this, but it is fair to suppose that the nervous system is overwhelmed by the toxin. That is, these two men were infected with typhoid fever and gradually developed a little toxin at a time. They developed headache, fever, and the disease came on gradually. Perhaps in the case of the woman there was a severe infection, or a rapid development of bacteria. We might say she was drunk with toxin when she came in, and is so now. This active and wild delirium in the beginning of typhoid fever is of rare occurrence; it often comes on before there is much fever. It may be mistaken for acute mania, and it is the experience of hospitals for the insane to receive these patients for acute mania and afterward to have them turn out typhoid fever; the clinical pictures are almost identical, and one could hardly be blamed for making a mistake, still it is less apt to occur if we have the possibility in mind. The cases that I have seen of this character have not turned out in the end to be very severe cases—that is, after the system once became accustomed to the toxins they did not affect the brain in that way, and they have run a mild course after the delirium was controlled by

the cold bathing. I do not know that this is the rule, but that has been my experience.

Now as to the treatment of typhoid fever. This disease is one of the oldest diseases of which we have any record, and it seems to have at first been confounded with a lot of other diseases that resemble it. So the clinical picture in the older books is not as distinct as in the writings of the last seventy-five or eighty years. It used to be classed with typhus fever, which in those days was a fairly common disease. The two diseases were not differentiated until fairly recent times, but still typhoid fever has now been known and studied for a long time. The medical treatment has varied all the way from giving a tremendous amount of medicine to giving none at all.

The cold-water treatment of typhoid is one of the oldest ideas in medicine. Cold water was used many years ago in Bellevue Hospital in this city, and its use was forbidden by the authorities because the mortality was so high, the reason being that the method of application was not correct. Indeed, we find this treatment has been alternately recommended and dropped for centuries, but now coming into use, and being finally established in the minds of all impartial observers as the best treatment of typhoid fever. The reason is that the successful treatment of typhoid fever by cold water depends upon the correct working out of the details of the treatment. In Bellevue Hospital many years ago the typhoid fever patient was put upon a rubber cot, and was sprinkled with ice-water with a watering-pot; as I said, the mortality was so high that the thing was forbidden. The important element that was lacking was the massage. We speak of tub-bathing; it seems to me it would be better if we called it tub-rubbing, or tub-massage, because without the rubbing the cold bath loses three-fourths of the benefits. Personally I feel very strongly that the full-length bath with the patient immersed to the neck is much better than the most skilful sponging, and it is much better than the cold pack, or sprinkling, or anything like that. As to the temperature of the bath, that is not of so much importance; the actual diminution of the temperature is only secondary to the tonic effect of the bath in improving the tone of the nervous system, to the improvement of the conditions of the lungs by stimulating deep breathing, and to the general vitalizing effect of the massage in the cool water. Of course the fall of temperature that follows the bath is an advantage, but the improved condition of the patient is of even greater advantage. These two men would probably do perfectly well without any special form of treatment; they are mild cases and are running along well, but by giving them the cold bath their general condition is improved, we shorten their convalescence, and prevent complications. The very fact that the success or failure of the cold-water treatment of typhoid fever depends upon matters of detail makes it rather desirable that we should have a hard and fast technique and stick to it very carefully. The temperature of the bath has been somewhat increased. When I first came in contact with the Brandt system of typhoid bathing, all the baths were given at 65°, and all given for fifteen minutes. The importance of having a definite fixed technique is also shown in cases which turn out to be more severe than we think they are going to be in the beginning.

In typhoid fever we cannot tell what form the disease is going to take, and unless we economize the patient's resources from the first we take away from him what he must fall back upon in case of a very severe relapse or a bad complication. So it is much better to treat every case of typhoid fever as if it were going to be a bad case. The baths in this hospital at the present time are given when the tem-

perature reaches 102.6°; they are given for twenty minutes, and the temperature of the water is varied from 65° to 85°, according to the judgment of the house physician. When we know that patients have been killed by ill advised and badly carried out cold-water measures, and when we feel certain that lives have been lost because cold-water treatment was neglected in the beginning, it shows that the technique should be a matter of careful thought and study, and that we ought to have a definite and fixed plan to apply to all our patients as a routine. These patients would be stimulated and the tonic effect would be much greater if the baths were made 65° or 70°. Of course, as I said before, they are doing perfectly well without it, but it seems to me that if anything should happen later on requiring of them a great deal of strength they would have more strength if they received a more tonic treatment at the present time.

The drug treatment of typhoid fever is a very broad subject, but it is one upon which it is quite easy to lay down certain principles. In the first place typhoid fever is a general infection of the system with the typhoid bacillus. It is not a disease particularly of the intestines, though certain characteristic lesions are found in them. The disease is a general one, and the germs can be recovered from the spleen and many other organs. We know from the general history of infectious disease that they recover according to a certain definite process. The system is infected with germs which produce their toxin; later there is produced an antitoxin which interferes with the growth of the germ. The system of the patient also becomes accustomed to the germs, and the patient gradually recovers and the germs are finally eliminated.

In certain diseases we know how to produce antitoxin outside of a body, and by injecting it into the patient to stop the progress of the germs. This has been tried in typhoid fever a great many times and on a very extensive scale, but the general judgment at the present time is that it has not been successful. This is the only specific treatment for typhoid fever that we can ever expect, and as long as we have not got it there is no way of cutting the disease short.

The use of laxatives early in typhoid fever and throughout the course of the disease may be of advantage on the same principle that an increase of the action of the bowels may be desirable with any sick person, but not on the ground that it has any effect on the course of the disease; it simply acts on the welfare of the patient. This year when I came on duty I found that patients were getting calomel; they seemed to be getting along pretty well, though the course of the disease has not been any different from what it always has been with similar cases. My own practice, which is like most of the hospital physicians in New York, is to give an enema every other day.

The diet in typhoid fever is a matter of much more indifference than is usually supposed. The exclusive milk diet, particularly a milk diet which is excessive in quantity, seems to have been a fashion in the past that was peculiar to New York. For quite a number of years in New York it was almost the universal custom to feed exclusively upon milk, and milk in large quantities. In other places, particularly abroad, they are much more liberal in other diet, and since we have tried the greater liberality in allowing almost all forms of fluid food, and sometimes semisolid food, the patients have done better, because their appetite has kept up, and they do not get so tired of their diet. There is no good reason for an exclusive milk diet.

The use of stimulants in typhoid fever must be governed to a great extent by the nature of

the case. Under the strict Brand treatment very little whisky is needed. When a medical student in the country the old physician would prescribe for a young girl as much as a pint or two of whisky a day. It was the custom to give the typhoid fever patient immense quantities of whisky with the idea that it would sustain the system. This practice was not one that was founded or carried on by thoughtless people, but by men of good judgment. Perhaps under the conditions it may have been the best thing. You have never seen the type of typhoid fever which gave the name to the "typhoid state." Our patients do not get into the typhoid state under the present plan of treatment. The patient in the typhoid state was delirious, the tongue and mouth were dry and parched, the pulse was rapid and feeble. The patient had no restful sleep at all; the skin was dry and hot. Now I can see very well why physicians who had to deal with patients in such a condition would feel that large quantities of alcohol might sustain life until they gradually pulled out of the typhoid condition. It is never fair to condemn any form of treatment unless we know under what conditions it is given.

Typhoid patients, or at least very few of them, are without need of heart stimulants. Their use must always be a matter of detail, depending upon the judgment of the physician.

AUTOINTOXICATION: ITS FACTORS, RESULTS, AND TREATMENT.[1]

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Autointoxication is self-poisoning by products of chemic, metabolic, or physiologic action within the organism. Under this definition must be included products of bacterial action modified by culture mediums furnished in the body. Culture mediums increase or diminish the virulence of a given germ, and hence affect its toxin and pathogenic results. Since culture mediums are furnished by the body itself their results are in greater or less degree autotoxic in origin. As the toxin is resisted by the body's opsonic power, and as this diminishes with diminution in general vitality, another autotoxic factor affects bacterial influence.

Two great types of autointoxication occur: the endogenous, whose products are the expression of perverted metabolism, and the exogenous, which results from changes in substances that have never entered the circulation as a whole. Physiologically speaking, a substance does not enter the system until it passes beyond the walls of the gastrointestinal canal. The two types often intermix, as products of the endogenous type, passing into the intestines, there intermingle with products of local imperfect fermentation, and the two are resorbed. The endogenous products often result from nerve tire. The first effect of nerve tire of the cerebrospinal system is to remove inhibitions on local nerve systems, which, in consequence, are unduly exalted and subsequently become exhausted.

The organic nervous systems being ganglionic in type are far from economic in force, unless controlled by the central nervous system. In this respect they are identical with the invertebrate nervous systems. Balance between the ganglionic system and the cerebrospinal has been secured by a long process

[1]Read before the Chicago Academy of Medicine, Feb. 23, 1906.

of development of which embryogeny preserves the picture. This process tends continually in the normal evolutionary direction of greater results from less expenditure of force. This lesser expenditure of force is secured by a specialization of functions which secures by an equable balance of several functions what was obtained in lower types by excessive work of a single organ. In the ameba, for example, the whole body serves as skin, digestive apparatus, excretory and reproductive apparatus, limbs, and sense organs. With rise into the vertebrate state the pseudopodia become permanent limbs, and the primitive appetite hunger becomes the origin of all desire. A balance results by which excretion and elimination occur from the combined action of the skin, lungs, liver, kidneys, bowels, and at times other structures. Many of these organs combine eliminative and metabolic powers. The lungs, for example, inhale oxgyen and exhale oxidation products. The liver is practically two organs, one poison-destroying and the other sanguifactive. If oxygen inhalation be imperfectly carried on, the great functions in which oxidation plays a part are imperfectly performed and endogenous autointoxication results. Because of such disturbance of oxidation the acid conditions occur which so often pass unrecognized in the etiology of various disorders.

Disturbance of the sanguifactive functions of the liver does more than interfere with proper blood-supply. It adds a toxic factor from a source that is properly nutritive and energy forming. Interference with eliminative elements produces an excretion which does not eliminate. The pale urine, for example, of nervous states is an expression of imperfect elimination with increased excretion. This is likewise true of certain bowel excretory conditions. Apparently complete action of regular type by the bowel may be present, yet as shown by indicanuria there is clearly autointoxication with resorption of products of imperfect intestinal fermentation. Indicanuria, an expression of undue strain on the kidney through excretion of products which should be eliminated by the intestines, interferes with proper elimination. In certain conditions normal excretion through end organs like the back of the throat and gums, which have retained to some degree the old function of the combined ano-buccal aperture of certain animals, becomes increased. This is particularly true of most toxic states, whether due to poisons or to autointoxication. For this reason the gums become blue in lead poisoning and green in copper poisoning. The same conditions in autotoxic states play a part in producing buccal imperfect digestion. The influence of oxidation is peculiarly evident in the starch changes. Fermentation of these in the intestine under the influence of the intestinal flora plays a large part in resorption of proteid products. The products of normal carbohydrate fermentation and putrefaction within the alimentary tract are formic, acetic, butyric, proprionic, valerianic, lactic, succinic, and oxalic acids. Putrefaction of protein yields the derivatives of the benzol nucleus—indol, skatol, phenol, and cresol, amido acids such as leucin, tyrosin, asparaginic and glutamic acids, hexone bases, sulphurous bodies like mercaptan, hydrogen disulphide, and other unclassified bodies containing neutral sulphur. Carbon dioxide, nitrogen, acetone, alcohol, methane, and hydrocarbon gases occur in greater or less quantities. Conjugation of the aromatic bodies occurs largely in the liver, but likewise to some extent in the lungs and kidneys. Many of these products are said to be nontoxic in the amounts in which they ordinarily occur, but this assertion ignores the fact that toxic states are due to accumulation of such products through non-elimination. This non-

elimination is in part due to the irritating action of intestinal products excreted through the kidney. In non-oxidizing conditions like the states of depression the accumulation causes acid states to a marked degree, and sometimes mimics markedly the acidosic phase of diabetes. The depressed states were long ago shown by Meynert to be due to imperfect oxidation. The cyanotic phases of the states of depression are due to other causes than simple deficient circulation. Suboxidation and autointoxication underlie this phase of the depressed states. It is deeper seated hematologically than is usually assumed. In cyanosis due to toxic products resorbed from the intestine Vander den Berg and Grutterink have found two sets of changes in the blood; in the first there was sulphohemoglobin, and in the second methemohemoglobin. These changes were due to the reduction of hemoglobin by nitrites. The first was relieved by purgation, the second required strict milk diet, returning when starchy vegetables like potatoes, old cabbage, turnips, etc., were added to the diet.

The influence of the nerve states on autointoxication, which has been denied by certain chemists, is susceptible of clinical and chemic demonstration. The chemist's side of the question ignores entirely the influence of non-elimination in producing systemic accumulation of products which would otherwise pass off without marked systemic effect. Another element of error appears in the conclusions as to perfect health in persons who do not complain of marked symptoms, albeit suffering from what they call "indigestion," "malaise," "not feeling well," etc. The standard of health like the standard of sanity varies with the analytic power of the individual who sets the standard. Clinical analysis of the cases in which indicanuria coexists with alleged perfect health demonstrates slight bearable degrees of morbid phenomena which afterward become the familiar features of autointoxication and the nerve state therefrom resultant. There is increasing evidence that acidosic states occur much more frequently than was assumed when the term was devised by Naunyn in 1886 to designate the poisonous acid states of diabetes. That sugar states, precedent to the acid, occur with great frequency after moral and other shocks C. K. Mills and others have demonstrated. Beyond a peradventure they produce glycosuria. The same is true of traumatism, surgical and otherwise. Many states produced by insolation (sunstroke) and electric shocks present the same phenomena. The cumulative influence of non-elimination in these states is evident in the fact that, before nervous explosions, low degrees of urinary acidity occur, succeeded by high degrees as the nerve state passes off. In some hallucinatory confusions consequent on traumatism similar states are found. In skull fractures periods of excitement with hallucination are far from infrequently preceded by seemingly sudden explosive purgings and vomitings with exhaustion resembling ptomaine poisoning. These states are followed by high degrees of urinary acidity. Acetone, diacetic acid, and B-oxybutyric acid are then found in considerable quantity. These conditions demonstrate that behind the autointoxication related to nerve state lie conditions of imperfect oxidation and elimination. Nerve states often mimic hepatic and renal colics. In many instances renal or hepatic calculus is seemingly shown, by such clearly defined abdominal symptoms, that laparotomy has been done but no calculus found. The underlying factor of these symptoms has been ignored by the ascription of them to hysteria, etc., but admitted chemical changes, from hysteric states, which might have underlain them are not taken into account. That hysteria markedly interferes with renal elim-

ination is shown in the enormous amounts of pale urine passed under hysteric excitement. The same is true of neurasthenia.

Non-elimination of the ordinary urine excretions means retention of these in the system with consequent toxic results. Careful researches on the status epilepticus have shown that precedent to this the urine is decidedly non-toxic to animals, but that subsequently it is as decidedly toxic. Pollakiuria has been often noted in both epileptics precedent to grand mal, and in hysterics precedent to grand hysteria. While there is a vesical element in such frequent micturitions the amount of urine passed shows that the chief factor is renal. Many types of autointoxication occur according as the point of view varies. Two great types depend on the place of formation. Poisons are formed in the interior of the body cells through metabolism. The most markedly toxic of these are the products of nerve tissue change. Nerve tissue is a complicated protein compound closely akin chemically to the most marked organic poisons. Its metabolic changes produce markedly toxic results. Hemmeter claims that if autointoxication were a common thing people should become accustomed to the presence of the autotoxic products just as they do to morphine and alcohol. The analogy is obviously a correct one, significantly demonstrative of chronic autotoxic states whose existence is completely ignored by most clinicians. The abuser of alcohol or morphine notoriously becomes the victim of a chronic nerve state called alcoholism or morphinism. In a similar way the self-poisoned individual becomes a victim of a chronic nerve state resembling those from diabetes, renal and hepatic insufficiency, gout, etc. Here typically grave neurasthenias occur which markedly simulate great neuroses like locomotor ataxia, in the absence of the reflexes, temporary changes in the optic nerve, mimicking optic neuritis, vertigo, marked depression, renal and intestinal disturbance resembling intestinal and renal crises, scattered neuralgias resembling lightning pains, swayings resembling Romberg's symptoms, and at times epileptiform and apoplectiform attacks like those of paretic dementia and locomotor ataxia. These phenomena, while demonstrating the validity of Hemmeter's analogy between morphine and alcohol poisoning and autointoxication, give it a totally different significance.

Autointoxication has also been classified by its sources. Albu thus makes four groups: (1) Autointoxication caused by loss of function of an organ, *e.g.,* myxedema, pancreatic diabetes, Addison's disease, etc. (2) Autointoxication from general metabolic abnormalities, *e.g.,* gout and oxaluria; strictly speaking here should be ranged all suboxidation intoxications, inclusive of lipomatosis, rheumatisms, diabetes, and acid states. (3) Autointoxication from retention of physiologic metabolic products in the organs like toxic phenomena after extensive dermic burns. These are most evident in pulmonary edema, since the lungs assume dermic eliminatory powers but fail in their proper performance, as well as in intestinal ulceration. In this group are conditions resulting from hepatic and renal insufficiency such as uremia. (4) Autointoxication caused by overproduction of physiologic and pathologic products like acetonuria and coma of diabetes and cancer. The first two states are as often due to underelimination as to overproduction. This underelimination frequently evinces itself in the deficient degree of urinary acidity precedent to an acidosic explosion, as well as in the non-acetonuric and non-acidosic morning urine of diabetes. These are attended by constitutional disturbance, that disappears with the acidosic, acetonuric afternoon and evening urine. Cancer autointoxication is due to overproduction of pathologic

products. The constitutional symptoms of cancer, even its fatality, are autotoxic rather than exhaustional phenomena. Sudden deaths in cancer frequently express suddenly occurring toxic states allied to uremia. This factor underlies the great danger from *x*-ray treatment. *X*-ray treatment in deep-seated, extensive cancers causes at times, as C. W. Allen has shown, so great and rapid tissue disintegration that the system is overloaded with waste products. It is most important to control the general constitution in such cases.

Assuming the two great factors of underelimination and overproduction, the local expressions of these come first under consideration. One much-neglected eliminatory region is the mouth. This survival of the old functions persists to a much greater degree than is usually believed. When a poison, exogenous and endogenous, fails of destruction by the liver and elimination by the kidneys, bowels, or skin, it finds exit by the mouth, particularly by the gums. This is why the blue line occurs in lead poisoning and the green line in copper. This is also why clinicians have been able to diagnose severe constitutional disorders from the appearance of the gums. The physician-dentist of Louis XV. correctly diagnosed a grave constitutional affection from the gums when from the intrigues of the du Barry, certain society physicians were claiming that fatal smallpox was a slight catarrhal fever. In diabetic conditions, as Tyson has shown, marked changes of the gums occur. Indeed, in all interstitial gingivitis examined in the prepyorrheic stage, indicanuria has been found. The eliminative tendency of the mouth underlies the vinous breath of diabetes and the fecal breath of constipation. The autotoxic eye conditions mimic, as Suker has pointed out, amblyopias and optic nerve changes produced by tobacco, alcohol, etc. Local irritations of the larynx and the internal ear by autotoxic products mimic catarrhal states. In laryngeal ulceration S. Solis Cohen has found that early symptoms pointed to typhoid, but later stercoremia was found and promptly relieved. Sometimes the earlier symptoms of stercoremia mimic pneumonia, and are relieved by treatment of the stercoremia.

Autotoxic skin disorders belong to the erythema group now generally recognized as having important constitutional relations. The uremides coincide with uremic manifestations —gastric, intestinal, pulmonary, or cerebral. Usually generalized without special arrangement, they may be localized on the limbs near the hips or shoulders, on the back, or over the sternum. Exacerbations occur with renal lesion variation and fluctuation in autotoxemia. Essentially erythematous, uremides may be vesicular, bullous, or even purpuric, according to the derm layer involved. They occur when the kidneys become less permeable in seemingly mild nephritic cases. They indicate more intense toxemia of grave prognosis.

Dermic manifestations in uremia are not necessarily uremides. In certain nephritics skin manifestations indicate a prognosis which becomes graver with the severity of the eruptions. The severest form of these dermatoses is acute exfoliative dermatitis. Dermatoses occur, as Karl Ullman has shown, from distorted interactions of organs of assimilation and elimination. A complex rôle is played by the varied, as well as commingled, products of imperfect digestion, malassimilation, intestinal fermentation, and fecal resorption, in such dermatoses as erythema, prurigo, urticaria chronica, strophulus infantum, and allied states. Tomassoli placed in a group what he calls the autotoxic keratodermatoses, tyloma, comedo, lichen scrofulosorum, psoriasis vulgaris, keratosis piliaris, ichthyosis chronica, lichen ruber, and eczema chronica. In all these types the renal modifications of fecal resorp-

tion products are necessarily very potent. These products when reabsorbed into the circulation exert a marked dermatologic influence if eliminated by the skin. The influence of cholemic tendencies in dermatology is shown in freckles, dark circles around the eyes, "bilious" complexion, and pregnancy pigmentation. These biliary melanoderma arise, as A. Gilbert has shown, from bile pigment in the blood.

The hematologic relations of the autotoxic dermatoses are, as Bezancon and Labbé have shown, very decided. There is generally an increased eosinophily. This occurs in prurigo, eczema, psoriasis (where it is accompanied with hyperleucocytosis, polynucleosis, and abnormal leucocytes), recurrent scarlatina from dermatitis, and in urticaria. Usually urticaria crops are accompanied with hyperleucocytosis and polyneucleosis; the eosinophily appears at the close. In bullous states eosinophily is marked. In the autotoxic dermic expressions of the untoward effects of drugs there enters largely the complex rôle of the morbid interaction of the organs of elimination.

The gynecologic relations are of three general types: (1) Those in which pelvic conditions are produced by autointoxication. (2) Those in which pelvic conditions produce autointoxication. (3) Those in which autointoxication is at once the product of pelvic states and aggravates these. The first type includes cases in which menstruation is affected without coexistent pelvic disease. Autointoxication may give rise to amenorrhea, dysmenorrhea, menorrhagia, and bromomenorrhea. Amenorrhea is apt to be associated with stercoremia, and less frequently with the purely toxic phases of diabetes, nephritis, etc. In the exhaustional phases of these it is quite frequent. In stercoremia, bromomenorrhea is frequent, especially where anemia coexists. Exceptionally in nervous cases the odor of the menses, like the odor of the skin, is pleasant, resembling violets, etc. In nephritis, early diabetes, rheumatism, and gout, menorrhagia and dysmenorrhea, especially of the menorralgic type, are particularly frequent. The menorrhagia of these states has two phases, sometimes coexisting. In one the periods are too close together, in the other the flow is too profuse. The second type includes the cases of uterine malposition, and tumors. The uterine malpositions may produce autointoxication by pressure on the bowel or bladder. The first interferes with evacuation, the second interferes with renal elimination through stimulus to too frequent micturition. The third type of uterine malpositions and tumors, by their effect on the general tone, increase nerve waste and decrease elimination. To these last effects are due their alleged reflex action. Herein they resemble the effects of eye-strain. In certain states, as in Bright's disease, diabetes, gout, rheumatism, chronic stercoremia, cholemia, scurvy, etc., metrorrhagia results from changes in the uterine musculature and arteries secondary to the autotoxemia. These last conditions interfere with menstrual elimination and are apt to set up strain conditions elsewhere, like uterine asthma. Many oöphoralgias and tube states are secondary to the autotoxic influences affecting the pelvis.

Among the toxic effects produced by stercoremia and allied autointoxication states are fever (of fatigue type, described by Vaughan), convulsions, coma, insomnia, headache, neuralgia, vertigo, incoördination mimicries of locomotor ataxia and allied conditions, aphasoid states, temporary hemiplegias, anemias, and the psychoses. Convulsions if developed on a neuropathic basis in an unstable subject may, through the rhythmic law of the nervous system, develop the epileptic habit. The epileptic status, as Meynert pointed out nearly four decades ago, is due to

underelimination of a protein compound. The protracted nerve autointoxications have already been outlined. The relative permanency of the traumatic neuroses probably depends on the tendency to autointoxication set up by traumatically disordered metabolic processes. This influence is shown in glycosuric and acid states set up by surgical operations. While anesthetics exert an influence, this is due to restraint of elimination by the anesthetic.

The psychoses clearly chargeable to autointoxication may assume nearly any of the acute types. They may present the emotional exaltation of mania, the emotional depression of melancholia, the complete stupor of stuporous insanity, but most frequently the type presented is, as Moyer and others have shown, that of acute confusional insanity. Here there is no true emotional basis. The delusive ideas may be depressed or exalted or alternating. The patient exhibits a certain amount of mental dulness which at times may be so extreme as to pass into stupor. The outbreak is usually accompanied with auditory hallucinations generally, albeit visual and odor hallucinations occur. In former days a stupid delusive conception of having committed the unpardonable sin was rather frequent, particularly so with coexistent stercoremia. Treatment of autotoxic states generally, aside from the symptomatic treatment, must be guided by certain broad principles. Four factors must be recognized. These are *overproduction of waste, suboxidation, morbid interaction of eliminative organs,* and *underelimination.* The broad conception should be that excretion does not mean elimination. Polyuria, for example, is generally excess of excretion attended by underelimination. Many states of nerve worry where there is marked metabolic change are attended by restraints on hepatic and renal function, shown in profuse pale urine and in feces of a similar type. Much stercoremia is attended by diarrhea, very frequently post-constipational. Here the error is confusion of bowel movement with elimination and confusion of large quantities of pale urine free from albumin and casts or sugar with normal renal elimination. Fecal resorption evinced in indicanuria, moreover, indicates an interference with renal elimination. The same morbid interaction of the eliminative organs appears in the asthma resultant on uremia and allied autotoxic states. This asthma indicates an interference with proper oxidation secondary to the autotoxic states, and increasing these. This need for oxygen may express itself in the tissue air-hunger which is found in other autotoxemias than diabetes.

The dietetic element of therapy is indicated by overproduction. All other things being equal, there should be a reduction of energy foods which tend to cause intestinal accumulation. A special danger from this is strain, through fecal resorption, upon the kidneys, liver, and lungs. The starches, like potatoes, bananas, old cabbage, turnips, carrots, parsnips, etc., should be greatly reduced in all persons whose labor is not manual. The woody elements of food, like the seeds of berries, the fiber of pineapple, radishes, etc., predispose to fecal resorption and are contraindicated. Fecal resorption means not only the resorption of products of intestinal fermentation of these foods, but likewise products of proteid and metabolic change poured into the intestine. On renal elimination under such circumstances strain due to fecal resorption is increased by red meats; prohibition of these is indicated where cylindroid, hyaline, and granular casts occur without albumin or sugar, but with abnormally high or abnormally low degrees of urinary acidity and indican. In certain instances large quantities of water will be indicated, not so much for the effect on the kidneys as for the effect on hepatic and intestinal ac-

tion. Polyuric states are peculiarly apt to be attended by constipation and by post-constipational diarrhea. Imperfect renal elimination, whether due to exogenic toxins like those of tuberculosis or endogenic toxins like that of uremia, may be relieved by supplying the liver and intestine with water. Indeed, alkalinized water will often relieve the unpleasant polyuria which accompanies and precedes pre- and post-acidosic coma. This suggests one phase of the medicinal treatment: Is it possible by medicine to relieve renal strain by transferring water excretion from the kidneys to the liver and intestines? The action of the hydragogue cathartics in anasarca gives an affirmative answer. These drugs, much neglected within the last two decades, are assuming once more a prominent place in therapy. It is best to combine them with agents having a hepatic direction and with agents affecting peristaltic action. A good combination is chionanthus, asclepias, leptandrin, podophyllum, iris, elaterium, and apocynum, with a small amount of eserine nitrate or sulphate to secure peristaltic action. As a means of directly affecting the intestinal changes which result in resorption, a combination of creosote, ol. betulæ, pancreatin, ox-gall, and ex. colocynth comp. and eserine nitrate often answers excellently. Balneotherapy for promoting peripheral circulation is peculiarly indicated. Cool sponging with water or alcohol down the spine on either side and on the inner and outer aspects of the thigh has a very beneficial effect. In insomnia the alterative effects of hypnotics which are likely to be detrimental should be taken into account. No hypnotic which affects the renal circulation or the blood prejudicially should be given uncombined with agents modifying such effects. Chloral hydrate, chloretone, trional, tetronal, veronal, and sulphonal exert such influences. A combination, however, of sulphonal and conium meets the indications through the influence of the conium, not only on the motor agitation but likewise on elimination.

NEPHRITIS: ETIOLOGY.[1]

BY AUGUSTUS A. ESHNER, M.D., PHILADELPHIA.

The inflammatory process may be considered as the reaction of living tissue to various forms of irritation. This reaction is essentially defensive, protective, conservative, and reparative, and it will vary in accordance with the character and the activity of the agencies concerned. The process is limited on the one hand by simple irritation, and on the other by degeneration or outright destruction. The irritant may consist in such physical influences as extremes of temperature or in the action of chemical substances, or in mechanical perturbations brought about by direct violence or the presence of foreign bodies. Injurious chemical substances may be introduced from without or be generated within the body as a result of fermentative or metabolic processes. Bacteria are phlogogenic in the capacity of foreign bodies, as well as through the poisonous substances to which they give rise.

Applying the foregoing generalizations to the kidneys it is obvious that these organs are by reason of their anatomical relations measurably secure against the untoward effects of extremes of temperature and of direct violence. On the other hand, they are not rarely the seat of foreign bodies, while they are exposed with great frequency to the action of

[1]Read before the Philadelphia Medical Examiners' Association, Feb. 6, 1906.

varied chemical substances of diverse source and origin, and also to that of bacteria brought to them through the circulation and from adjacent viscera. Of the several etiologic factors concerned in the development of nephritis, by far the most important are comprised in bacteria and chemical substances conveyed to the kidneys through the blood-stream. The affection is thus a common concomitant or sequel of the various infectious processes. The character of the resulting disturbance will depend largely upon the intensity of the exciting irritant. Under all circumstances parenchymatous structure and interstitial tissue suffer together, though in varying degree. When the irritation is pronounced and the inflammatory reaction marked, acute diffuse nephritis results, while tubular nephritis or glomerulonephritis follows if the irritation is less pronounced and the reaction less marked. In either event the morbid process may become chronic and secondary hyperplasia of interstitial tissue may take place, with or without contraction. When the irritation is still less pronounced, especially if it be long continued and the reaction correspondingly little marked, chronic interstitial nephritis results. Accordingly, certain toxic influences and also certain abnormal circulatory states play the most important etiologic rôle here.

Of the causes of acute nephritis the infectious diseases occupy the first place, especially those attended with febrile elevation of temperature, and among these scarlet fever easily stands at the head of the list. Much if not all of the so-called febrile albuminuria is probably of nephritic origin. Other diseases in connection with which nephritis has been observed with greater or lesser frequency are influenza, diphtheria, and other infectious forms of sore throat, febrile icterus, pneumonia, acute articular rheumatism, typhoid fever, typhus fever, septicopyemia, erysipelas, measles, beriberi, chicken-pox, mumps, malarial fever, smallpox, vaccinia, tuberculosis, syphilis. That the inflammation of the kidneys is due not merely to the elevation of temperature is shown by the fact that it may occur in connection with non-febrile infectious diseases. Besides, in many instances, clinical and experimental, the exciting bacteria have been found in the diseased organs. In addition, the toxins generated by the microörganisms, brought to the kidneys with the blood and eliminated in part with the urine, contribute in greater or lesser measure to the production of the nephritis. The almost constant presence of the colon bacillus in the bowel and the migratory tendency of this microörganism render it probable that it is not an uncommon excitant of nephritis.

The toxic substances that cause nephritis may be generated within the body as a result of fermentative or metabolic processes, or they may be introduced from without. Of the former some may be normal to the body, but produced in excess or not perfectly eliminated —for example, bile; while others may be altogether abnormal—for example, products of intestinal putrefaction or of deranged metabolic processes. The nephritis of gouty origin and that associated with diabetes mellitus are probably to be included here. Albuminuria, at times associated with the presence of tube-casts, is frequently observed in the sequence of more or less active exercise, and it may be accepted as an indication at least of renal irritation. If the exercise be unduly violent or long continued or oft repeated, it can be readily understood that nephritis may develop in consequence.

Of the second group of toxic substances, some—for example, lead, mercury, copper—may gain entrance through exposure in certain occupations; others, perhaps employed medicinally—for example, potassium chlorate,

carbolic acid, turpentine, preparations of mercury, arsenic, lead—may by accident or design be ingested in excessive amount. Highly seasoned food and alcohol belong in the same category.

Exactly what part exposure to cold and wet plays in the etiology of nephritis cannot be definitely stated. In all probability it acts rather as a determining influence, lowering tissue resistance, and thus favoring the pathogenic activity of microörganisms already, perhaps always, present. It may be that, in addition, such exposure leads to changes in the blood and to circulatory alterations favorable to or resulting directly in the development of nephritis. Less importance is attached to the influence of cold and wet as excitants of the inflammatory process, since the part played by bacteria and their products in this connection has been appreciated.

Nephritis is a comparatively common complication of pregnancy. To what causes in particular the disorder is due under such circumstances has not been clearly established, although it seems probable that the condition is essentially toxic or metabolic in origin; nevertheless circulatory derangements resulting from pressure of the enlarged uterus on the abdominal vessels, and also pressure on the ureters, may not be altogether without effect here. The complication is most common in first pregnancies and during the second half of gravidity, and it is more likely to attend multiple than single pregnancies.

Chronic nephritis may be primary or secondary—that is, it may develop as a result of the long-continued action of insidious irritation, or it may follow upon one or more attacks of acute nephritis. In the first instance the interstitial connective tissue of the kidneys is by preference likely to undergo hyperplasia, with eventual contraction; while when the disease is secondary the glomerular and tubular epithelium suffers most at first, with or without subsequent fibrosis. In other respects the etiological factors are much the same as those that have already been referred to. Of especial and peculiar importance in this connection, however, are diseases of the circulatory apparatus. Chronic nephritis may be a direct result of arteriosclerosis, or both may be the joint product of a common cause. Hypostasis or hyperemia of the kidneys as a result of valvular disease or hypertrophy of the heart, or from myocardial weakness or degeneration or of other origin, may eventuate in chronic nephritis.

A hereditary or familial tendency to chronic nephritis has been observed, the disease appearing simultaneously or consecutively in several members or in successive generations of the same family. Under these circumstances arteriosclerosis appears to be the etiologic factor, or at least an associated condition.

BOOK REVIEWS.

LECTURES ON TROPICAL DISEASES. By Sir Patrick Manson. Chicago: W. T. Keener & Co., 1905. Price $2.50.

This volume comprises the Lane lectures delivered at the Cooper Medical College, San Francisco, in 1905. No more striking advances in the domain of medicine are to be found than that which relates to the pathology of tropical diseases. The advance has been proportionately greater than any other department of medicine, as it is only within a few years that these diseases have been the subject of scientific investigation. The author refers to some of the responsibilities of America in relation to our tropical possessions. San Francisco is spoken of as being the western frontier of America, and that it will be destined to occupy much the same relation to this country as London did to Europe. The division of tropical medicine is brought about by the fact that certain disease germs are restricted to favored spots. The typhoid bacillus, tubercle bacillus, and the germs of pneumonia, tetanus, measles, and smallpox have a world-wide distribution. There are two or three diseases peculiar to temperate climates, but by far the largest number of climatically restricted diseases are indigenous to the tropics. Tropical diseases may be latent and appear after prolonged residence in a temperate climate. Only two or three diseases can be said to be restricted to the tropics; one is that curious skin affection called pinta, a sort of ringworm.

Climate in relation to disease germs exercises its influence in one of several ways: the germ after it has left the body of a human host has to undergo certain changes in warm water or warm earth; after being deposited in the earth or water the germ may have to undergo development in some tropical animal before it can again infect a human being; the germ may not be able to escape from the human host without the aid of some tropical animal; this abstracting and implanting agency may be required not only for these purposes, but to serve as a medium in which the immature germ may undergo development; certain tropical toxemias whose toxins are produced outside the human body depend for their virus on germs acting on certain media, for which action a high temperature is necessary.

The first parasite discussed is the hookworm, responsible for coolie anemia. Hookworm disease is very common in the United States, hence it is especially important to American physicians. Dracontiasis, or endemic hemoptysis, is not likely to be seen in America, but it is due to a parasite which is a representative of a very interesting group. The guinea-worm and its peculiarities are described. The water-borne diseases include the filariasis with its accompanying enlargement of the extremities and other parts, of which some very striking illustrations are given.

In closing the discussion of malaria the writer says that there is no observation capable of bearing investigation that would lead to the supposition that malaria can be acquired under natural conditions except by the mosquito bite. The subject of tropical fevers is fully gone into. The recent additions in this category are trypanosoma fever and the fever of splenomegaly. The writer expresses the belief that discoveries of other fevers will soon be made.

In the concluding lecture the writer deals especially with yellow fever, that subtropical disease which is peculiarly American. He says that Reed deserves a monument and his colleagues governmental recognition. He accepts as conclusive the following postulates regarding the infecting agent in yellow fever: It is in the blood of the patient during the first three days of the disease; the first step in the passage of the germ from the sick to the sound is made under natural conditions in the stegomyia mosquito; after about twelve days the germ can be reimplanted by the mosquito in another human being, and it is then capable of reproduction; at the end of a further period of about three days it has established itself throughout the blood, causing the violent clinical manifestations which are known as yellow fever. One of the most striking peculiarities in the dissemination of yellow fever is its restriction to West Africa and the West Indies. The fact that it has not invaded the populous centers of the East is due to the comparatively limited transportation facilities from its natural habitat. The author believes that this will be all changed with the construction of the Panama Canal and the necessity of strict sanitation of the isthmus if the implantation of this terrible scourge in the East is to be avoided. He believes that it is almost providential that the delay in digging the Panama Canal should have permitted the discovery of the cause and method of transmission of yellow fever. The importance of tropical medicine to Americans when considering the expansion toward the West means that all members of the profession who propose to practice in tropical countries should be thoroughly grounded in the pathology of tropical diseases. The rudiments of tropical hygiene should be taught in all native schools and tropical countries. All government employees in tropical countries should know about and understand the rôle of insects in the

spread of tropical diseases. The author insists that there should be a school for tropical medicine in the United States, and the best location for it he believes is San Francisco.

These lectures, while by no means a complete treatise on tropical medicine, give a bird's-eye view of some of the later discoveries which have thrown a flood of light on that obscure page known as the unhealthfulness of the tropics. It has remained for the last few years to demonstrate that humidity and temperature alone are practically negligible in their effects on human beings, but they do furnish a fruitful soil for the development of various insects which alone are responsible for the unhealthfulness of tropical countries. To those who are at all interested in this most brilliant chapter in the development of modern medicine we would recommend the perusal of these lectures.

RADIOTHERAPY IN SKIN DISEASE. By Dr. J. Belot. Translated by W. Deane Butcher, M.R.C.S. New York: Rebman Company, 1905.

Radiotherapy is assuming such extraordinary proportions that a number of text-books have been devoted to the subject. Among the best of these we must rank the translation of Belot's work. The data upon which the work is largely founded were obtained in the Broca Hospital of Paris, where Brocq had watched the development of radiotherapy for a number of years. Some years ago the latter associated with Dr. Belot, who devoted his entire time to investigating and studying the remedial effects of radiations. This book is the result. The writer has made it more than a compilation; he has not confined himself wholly to the clinical side, but has gone into a theoretical consideration, though not to such an extent as to embarrass the reader not versed in electrical technique. After a short historical account the writer passes to the practical description of the production of the *x*-rays. There is an account of the measurement of the *x*-rays and of the theory upon which they act.

The second part of the book is taken up with a discussion of the biologic effects of the Roentgen rays, which is followed by the therapeutic portion dealing with the different forms of skin diseases which have been treated by the Roentgen rays. This is one of the most brilliant chapters in modern therapeutics. In discussing the availability of the *x*-rays for the treatment of epithelial neoplasms a certain degree of conservatism is expressed. In certain cases a complete cure is effected, and most cases of cutaneous epithelioma are modified or apparently cured, recurrence being less frequent than after surgical operations. Any elevation of the skin should be removed by surgical means before proceeding to radiotherapeutic treatment. In primary cancer of the breast or deeply seated organs treatment should be radio-surgical. If the neoplasm is small, superficial, and without glandular enlargement, either of the two methods may be employed, but the preference should be given to surgical interference. In cases of recurrence after operation, radiotherapy gives better results than surgery. A successful result is more probable when the glands are but little affected. Toxemia if it ever occurs is very rare. With our present knowledge it is difficult to say whether the cure is permanent or only apparent. In a certain number of cases there has been no recurrence after several years.

DOSE BOOK AND MANUAL OF PRESCRIPTION WRITING. By E. Q. Thornton, M.D., Ph.G. Third Edition, Revised and Enlarged. Philadelphia and London: W. B. Saunders & Co., 1905. Price $2.00.

In common with other works on materia medica the changes in the Pharmacopœia of 1905 have made it necessary to revise Thornton's work. The author has taken advantage of the opportunity to add considerable material, and it now deals with the official and the more important non-official preparations. The work is especially opportune at this time, as the writer has devoted considerable attention to weights and measures and the equivalents of the Troy and apothecary weights in the decimal system. The adoption in the last Pharmacopœia of the decimal system has made it almost essential that the physician should familiarize himself with the French system. One of the most useful sections in the book is that on prescription writing. This contains a description of the Latin terms and the grammatical methods by which they are formed. Part 3 deals with the special preparations and methods of prescribing; Part 4 with dosage. In reference to the latter the writer says that there is no ready method of memorizing doses, as the exceptions to any rule are so numerous as to destroy the value of such grouping. It is recognized that dosage is variable, and those that are employed are approximately the proper quantities for adults when given by the mouth. There is an appendix dealing with the common poisons and their antidotes. The work is bound in flexible covers, and is handsomely issued by the publishers.

GALL-STONES AND THEIR SURGICAL TREATMENT. By B. G. A. Moynihan, M.S. (Lond.), F.R.C.S. Second Edition, Revised and Enlarged. W. B. Saunders & Co., 1905. Price $5.00.

The first edition of Moynihan's work on gall-stones was exhausted in eight months. This shows the interest which the profession feel in surgical technique. The writer's clear descriptions and simple methods have made this and his other works on abdominal surgery much sought after by the practical surgeon. This second edition exceeds the first by some 70 pages. Many additional case records have been incorporated, and a number of new illustrations added. There is a chapter

B. J. C.

on congenital abnormalities of the gall-bladder and bile-duct. The whole text has been carefully revised. The work is very handsomely issued by the publishers, being printed on extra heavy paper with wide margins and double-leaded. The illustrations are artistic, especially the nine colored plates.

The congenital abnormalities are of practical interest for the surgeon notwithstanding that they are comparatively rare. The cases of atresia or obliteration of the bile-ducts in early infancy are due to inflammatory changes and not to aberrations in development. The common types of variation are figured in four schematic representations. One of the most striking of these abnormalities is one in which there were several ducts opening into the duodenum. In discussing the origin of gall-stones the writer adopts the theory of infection. Acute infection of the gall-bladder may occur without the formation of gall-stones. The injection of attenuated cultures causes no change if drainage is free; likewise the retention of bile brought about by the introduction of sterile foreign bodies does not cause the formation of stone. With retention of bile by a foreign body or stricture of the duct an associated infection will cause stones. There is a very full discussion of the general pathology of gall-stone disease. The symptomatology and differential diagnosis is gone into quite fully, followed by a chapter on the special symptoms of gall-stone disease by V. Naunyn, who recognizes a regular and irregular cholelithiasis. To the clinician familiar with the protean manifestations of this disease, this special emphasis will seem peculiarly appropriate. The remaining portion of the work is taken up with a discussion of the surgery of gall-stones.

THE PRINCIPLES AND PRACTICE OF MEDICINE. By William Osler, M.D. Sixth Edition, Thoroughly Revised, from New Plates. D. Appleton & Company, New York and London, 1905.

Dr. Osler's friends—and no man has a greater number—have watched with interest and delight his remarkable successes and achievements as a medical observer, investigator, teacher, and writer; and they see reflected from the pages of this book the experiences, thoughts, and erudition of his master mind.

Of the many books upon the practice of medicine, some one must be the best; even of the best there must be *the* best, and there is little doubt that it is this one. The amount of material contained in these 1100 pages seems to be limitless, the number of original observations unparalleled. The useful and unique examples with which the work is replete seem to be chosen with the greatest care. The thoughts of the author are expressed with that choice diction whose forcible conciseness has made him the ideal professor. In spite of the enormous scope of the work, the treatment of each subject is concise and to the point, leaving nothing to be desired, except by those who have taken issue with the author upon his disregard of conventional therapeutics. It is refreshing, however, to see a man who is bold enough to defy public sentiment and convention and who does not hesitate to say when treatment may or may not be employed, and to omit from his writings all the thousand and one medicaments that do no good and sometimes may do harm, and that hinder the progress of medicine by humbugging the patient, deluding the doctor, complicating the physiological conditions, and limiting the ability of the practitioner accurately to observe the progress of the disease.

Instead of recommending Osler's book to the student and practitioner, we make bold to say that he must have it and cannot get along without it, and that the more he reads it and the more he becomes acquainted with its literary and scientific merits, the closer he will come to a personal knowledge of the man who has been a greater source of inspiration to the medical students of this country than any other.

THE ELEMENTS OF PATHOLOGICAL ANATOMY AND HISTOLOGY. For Students. By Walter Sydney Lazarus-Barlow. Philadelphia: P. Blakiston's Son & Company, 1905.

To students who are familiar with Dr. Lazarus-Barlow's excellent and unique Manual of General Pathology, which justly deserves to be called one of the most useful books upon the subject, this newer work must be received with a feeling of considerable disappointment. The order in which books are usually written has been reversed; the elementary text-book has made its appearance after the *chef-d'œuvre*. One reads a good book by a successful author, and naturally looks for a better one from the same author as the result of his enlarged experience.

As a matter of fact, it is only by comparison that the present volume appears inferior to its predecessor. The preface announces that it is an elementary work for the student, and a careful survey of it shows that this is the case. As such it contains scarcely anything that is not to be found in other books of the same class; and as such we probably should not look to find anything not common to all books on the same subject.

The illustrations, of which there are 171, are drawn from nature by the author's wife and his friend, Dr. Goldsmith. Some of them are excellent, but the majority of them are on a par with those found in other books. Indeed, in their finish they are perhaps not quite up to the average of illustrations usual in similar text-books at the present time. We regret that the publishers have produced the book in so large a volume; also that they have increased the length and breadth of the Manual of General Pathology, which

first came out in a smaller and much more handy form.

For the student the book is a safe guide. It seems to contain a brief and probably sufficient mention of all the essential morbid states, but for the practitioner it will not be found of very much use, probably acquainting him with nothing not familiar to him since his student days.

A Manual of Materia Medica and Pharmacology. By David M. R. Culbreth, Ph.G., M.D. Lea Bros. & Co., Philadelphia and New York, 1906. Price $4.75.

The author is professor of botany and materia medica in the University of Maryland. This work is the fourth edition, the three previous editions having been exhausted during the period of nine years. In each successive edition an effort has been made to improve the work. Notwithstanding that the work has been out of print for a number of months, a delay has been necessary that it might be brought into accord with the last revision of the Pharmacopœia. The author does not regard the dosage of the Pharmacopœia as altogether satisfactory. In consequence of the necessary changes the current edition approaches more nearly to a new work than any of its predecessors. The principle of classification adopted is that of grouping together those substances which have a common or allied origin. Botanical sequence is largely followed in the classification of drugs of vegetable origin, and the zoölogical sequence in those of animal origin. The metric system is used, and the approximate equivalents in English measures are given. The centigrade measurement of temperatures is followed associated with the Fahrenheit scale. The work is a pure materia medica, though the uses of various drugs are briefly indicated. It contains 487 illustrations. An appendix deals with the microscope and its use in materia medica and in the drug store. There are chapters on poisons and antidotes, prescription writing, and tables of weights, measures, and doses.

Pharmacology and Therapeutics. By Reynold Webb Wilcox, M.A., M.D., LL.D. Sixth Edition. Philadelphia: P. Blakiston's Son & Co., 1905.

This volume is based on the fifth edition of White and Wilcox's "Materia Medica and Therapeutics." The call for a new edition has been taken advantage of by the author to rewrite the book and bring it in accord with the last decennial revision of the Pharmacopœia. The work is divided into two parts, the first dealing with materia medica and pharmacy, and the second, the volume under review, with pharmacology and therapeutics. The classification followed is based upon the physiological system upon which the various drugs or their agents principally act. Each drug and its preparations are given without special description except as to dosage; the list is followed by an elaborate account of their physiological action and therapeutics. The arrangement will be better appreciated in taking a few examples, such as the silver salts. The three official salts of silver are given, and the unofficial salts, together with the so-called organic preparations of silver, which constitute eleven preparations. The external and internal actions of the silver salts are then discussed, together with the therapeutics, followed by the toxicology. This arrangement produces a far more readable book than where each preparation is separately discussed, which would of necessity involve a good deal of repetition. The work opens with some excellent comments on some of the later theories in relation to therapeutic action, notably that of the ions. The work is well printed, and forms an excellent addition to the literature of pharmacology and therapeutics.

Genito-urinary Surgery and Venereal Diseases. By J. William White, M.D., and Edward Martin, M.D. Sixth Edition. Philadelphia and London: J. B. Lippincott Co.

The massive work of White and Martin on genito-urinary surgery has reached its sixth edition. It remains one of the standard treatises. It is the largest single work dealing with genito-urinary diseases, and it is the most complete. The frontispiece of this edition contains a colored illustration showing the spirochaeta pallida. There is also an example of spirochaeta refringens, which by comparison is a more distinct spiral and much thicker than the pallida. The latter is said to be seven microns in length, and varies from an immeasurable thinness to .5 of a micron in width. The curves vary in number from three to twelve. It is motile, and the ends are distinctly pointed. The writers begin with a description of the anatomy, and then deal with malformations; then there is a description of the diseases of the urethra and of affections characterized by urethral discharge. That urethritis may occur associated with the exanthemata or with traumatism is recognized. The chapters dealing with the surgical affections of the bladder and genito-urinary tract are very full and complete. The last portion of the work deals with syphilis, including its complications.

The Diseases of Infancy and Childhood. By Henry Koplik, M.D. Second Edition. Lea Brothers & Co., Philadelphia and New York, 1906. Price $5.00.

The work of Koplik forms a treatise of 885 pages, in which is reflected existent pediatric knowledge. We have rather more of the author's experience than is common in large text-books, but this might be expected in one of his wide experience and originality. The

work is essentially clinical, and to keep it abreast of this rapidly advancing department of medicine this second edition has not only been thoroughly revised but parts of it rewritten. Theoretical and impractical methods have been largely excluded from the volume. An entire section of the work containing 85 pages is devoted to a thorough discussion of infant feeding, both natural and artificial. This is no mere empirical statement of how to feed children, but the principles underlying the process of nutrition and digestion are fully stated. In the treatment of diphtheria the writer speaks in no uncertain language of the value of antitoxin, but the dose advocated is rather small, particularly for the severer infections and those which are seen late in the disease.

The work has been well issued by the publishers. It contains many handsomely colored full-page halftone plates.

Serum Disease (Die Serumkrankheit). By von Pirquet and Schick. Vienna: F. Deuticke, 1905. Price 4Mk50.

The occurrence of exanthems after the transfusion of heterogeneous serums was described as early as 1874 by Dallera, and has been made the subject of frequent communications since. Since the introduction of serums for the treatment of infectious diseases, not only exanthematous eruptions but various other local and general morbid conditions have been observed to follow the injection of serums, especially horse serum, in man.

Hubner and Boky in 1905 showed that the antibodies played no part in the pathogenesis of these exanthems, but that it was dependent on the heterogeneity of the serum used. Hartung, in 1896, showed that a period of incubation always preceded the occurrence of the exanthems. Hamburger and Maro, in 1903, showed that the human organism reacts with the frequent introduction of heterogeneous serums by the formation of precipitins. The incubation period is due to the slow absorption of the serum, which is complete in about twenty-four hours. The exanthems may begin in from eight to twelve hours with definite prodromes, such as local sensitivity, red tint and slight swelling of the skin, and a slight enlargement of the lymphatic nodes corresponding to the point inoculated. Fever is the least characteristic sign of the affection. It may be ordinary or remittent, in summer intermittent in type. Its intensity does not depend either upon the activity or the duration of the malady. As a rule, considerable fever coincides with a measles-like eruption, less fever with a scarlatinal form, and very little fever with urticaria-like eruption. Various forms of exanthems occur in different individuals, and sometimes in the same individual. Urticaria is the most frequent type. As a rule, the exanthems make their appearance near the point of injection, and may often be confined to it. The generalized eruptions are symmetrically morbilliform. They occur by preference on the extensor surfaces of the members and are remarkable for their great itchiness. Their duration rarely exceeds two or three days. The enlargement of the lymphatic glands constitutes an important sign of the disease. Seven or eight days after the administration of the serum the nodes nearest the point of inoculation begin to swell, and they become hard and sensitive to pressure. Sometimes the enlargement of the lymphatic nodes is general. Their condition has some prognostic value, as when their consistency returns to normal it indicates the termination of the disease. During the period of incubation there is a moderate increase in the number of leucocytes, but as they diminish leucopenia is the chief characteristic. Pain in the joints is occasionally observed. It may occur in any of the articulations, especially the metacarpophalangeal, less frequently the elbow and the knee. The pain may be severe, does not last long, and is not influenced by salicylic acid. Edema is a constant symptom. It has the same distribution as that of Bright's disease; its disappearance indicates the termination of the malady. Malaria when present is very slight and accompanies the appearance of the edema. It is not considered to be of renal origin. The general condition is rarely serious. Von Pirquet and Schick consider the serum disease not to be dependent upon the existence of precipitins, but upon some sort of reaction *in vivo* by which the formation of an antibody is brought about.

Much space is given to the effect of reinjection, and considerable space is devoted to the pathogenesis of the serum disease.

The Practice of Medicine. By James Tyson. Fourth Edition, Revised and Enlarged. Philadelphia: P. Blakiston's Son & Co., 1906. Price $5.50.

The magnificent work of Tyson has grown into a volume of 1305 pages. Since 1905 four editions have been called for. Each one has been an improvement upon its predecessor. The last contains over 60 additional pages of new matter, together with numerous minor changes and corrections. One of the most important changes is in the section of animal parasites, which has been revised by Dr. A. J. Smith, a recognized authority on this important and practical subject. The work contains 240 illustrations, including a number of colored plates. The work has been prepared from a practical standpoint and with special reference to diagnosis and treatment. In a work as large as this it would be impossible for us to refer in detail to its various divisions. Suffice it to say that it has been prepared by an accomplished teacher and represents up-to-date American medicine.

THORNTON'S POCKET MEDICAL FORMULARY. By E. Quin Thornton, M.D. Seventh Edition. Lea Bros. & Co., Philadelphia and New York. Price $1.50.

Thornton's formulary, which has been before the profession for a number of years, has been revised in accordance with the new edition of the Pharmacopœia. In previous references to the work we have commended it, not that any one would rely upon a pocket formulary in the treatment of disease, but it meets a need. It contains nearly 2000 prescriptions arranged according to diseases. In the preface the writer says that it is necessary to *caution* readers that it conforms to the new Pharmacopœia. The changes in standards have doubled the strength of some preparations and reduced that of others. The revision is not confined to the changes necessary to bring it in accord with the revised standard. Critical study has been given to each formula in all its parts, the endeavor having been made to summarize the best therapeutics of the day. A convenience, and one which should tend to popularize the metric system, is the placing of the equivalents in both apothecary and standard measures. The work is a compactly printed little volume, bound in flexible covers, with a flap. An addition to the present edition is increased attention to the indications for each prescription.

NERVOUS AND MENTAL DISEASES. By Archibald Church, M.D., and Frederick Peterson, M.D. Fifth Edition. Philadelphia and London: W. B. Saunders & Co., 1905. Price $5.00.

The work of Church and Peterson has grown into a magnificent treatise of 937 pages, the later editions showing marked improvement over the earlier volumes. The chief changes in the present work are those which are necessary to bring it abreast of the current literature. In the section on insanity the classification of Kraepelin has been added to the chapter on classifications for the purposes of reference. Two new chapters have been added on manic depressive insanity and on dementia precox respectively. The work, by reason of its clear clinical pictures and succinct style, early received the indorsement of the profession. The merit of the work has been augmented in every edition.

A COMPEND OF MEDICAL CHEMISTRY. By Henry Leffmann, A.M., M.D. Fifth Revised Edition. Philadelphia: P. Blakiston's Son & Co., 1905. Price $1.00.

This little volume belongs to the quiz compends, the *raison d'être* of which is stated by the author, who says that compends are books that most professors and reviewers condemn and that nearly all students use. The present system of instruction in professional schools is such that students are required to meet two distinct requirements: they must study for the knowledge necessary for the practice of the profession, and they must study to pass examinations. For the latter purpose they are aided by a succinct summary of the subject such as is presented by the compend. The volume deals with the principles of chemistry, both inorganic and organic. The latter portion takes up briefly applied medical chemistry.

THE PHYSICAL EXAMINATION OF INFANTS AND YOUNG CHILDREN. By Theron Wendell Kolmer, M.D. Philadelphia: F. A. Davis Co. Price 75 cents.

This valuable little volume deals with the physical signs of disease in infancy. It naturally opens with a discussion of the kind of babies doctors have to examine. The writer divides them into three groups: the baby that will let you do anything to him; the nervous, excitable, and timid baby; and lastly, the spoiled or vicious child. The first may be regarded as a medical treasure, the second, usually reared in a neurotic family, can often be managed with skill and patience. The spoiled child is to be met by the same firmness that the horse-trainer shows in his work. The writer differentiates the crying of children and points out its significance. The history in pediatrics is looked upon as all-important, as is the weighing machine and tape measure.

SAUNDERS'S QUESTION COMPENDS. Essentials of Materia Medica and Therapeutics and Prescription Writing. Arranged in the Form of Questions and Answers. By Henry Morris, M.D. Seventh Edition, Thoroughly Revised and Adapted to the Eighth Revision of the United States Pharmacopœia by W. A. Bastedo, Ph.G., M.D. Philadelphia and London: W. B. Saunders & Co., 1905. Price $1.00.

Those familiar with Saunders's Question Compends will appreciate the value of this little work. The books taken as a whole form an excellent substitute for a teacher, as the questions are such as are commonly propounded in the classroom. The work has been brought fully up to date, and the accompanying index, which is very complete, makes it a useful work for reference and study.

A TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS. By Arthur R. Cushny, M.A., M.D., Professor of Pharmacology in the University College, London. Lea Brothers & Co., 1906. Price $3.75.

This is the fourth edition of Cushny's Pharmacology. With the appearance of the first edition it was at once accepted as a standard authority in its field. The author is a diligent, painstaking investigator. In both therapeutics and pharmacology he ranks as an authority. The last revision of the United States Pharmacopœia has necessitated a thorough revision. To the former editions we have referred favorably, an opinion that should be repeated regarding the present volume.

ABSTRACTS.

THERAPEUTICS.

The Treatment of Diabetes Mellitus.—

WILLIAMSON, R. T. *Medical Chronicle*, vol. x, No. 4, 231, January, 1906.

The writer comments on some recent discussions relative to the treatment of this disease. Lauritzen claims that under a rigid milk diet the diabetic symptoms may disappear for a time in mild cases and those of medium severity. A permanent cure cannot be obtained, and better results follow an ordinary rigid diabetic diet. The milk diet is of value when certain complications are present, such as chronic nephritis, with cardiovascular changes, arteriosclerosis with degeneration of the myocardium or aortitis, diseases of the liver, skin affections, and in acute febrile states such as pneumonia and typhoid fever. In cases of diabetes associated with chronic nephritis, when dyspnea and edema occur one liter of milk and a half-liter of cream daily should be given. With improvement the quantity of milk should be diminished, with a gradual return to a mixed diet. In severe cases of diabetes, when acid intoxication occurs and coma is threatening a milk diet is indicated, along with large doses of alkalies with aperients and cardiac tonics. When the risk of coma diminishes, and when there is dyspepsia and constipation, a mixed milk diet is better, along with alkalies and aperients. In recent and moderately severe cases in which there is slight acidosis the milk diet is not indicated.

Oatmeal has been recommended by von Noorden. It is given in the form of soup, made of oatmeal 250 grammes, butter 300 grammes, roborat 100 grammes; a portion of this soup is given after two hours with a little wine, cognac, or coffee. The treatment is continued for two or three weeks. In ten severe cases von Noorden obtained a greater tolerance of the carbohydrates by this method. The general condition of the patient remained the same or improved. In a series of cases of threatening coma the prodromal symptoms disappeared under the oatmeal treatment, but there was no improvement in the tolerance of carbohydrates. In other cases the oatmeal treatment had no good effect. The oatmeal treatment may be given when it can be carefully watched, when the usual dietetic treatment fails to alter the sugar excretion, and when the weight is diminishing and the acidosis is not changed under alkaline treatment.

Mossé says that potatoes can be substituted for the bread in the treatment of mild cases with advantage; in the medium and severe forms of the disease as a rule potatoes should not be given.

Friedenwald and Ruhräh rarely find it advisable to place patients on an exclusive milk diet, except in severe cases in which diacetic acid is present in the urine and coma threatens. In many cases they give a half-liter or liter of milk with other allowable food with excellent results. The effect of the milk should be carefully observed. In a number of cases they have replaced a portion of the bread taken by diabetic patients with potatoes. In a considerable number of cases the results were excellent, the change of diet being very pleasing to the patient. The oatmeal treatment is especially useful in those forms of diabetes showing diacetic acid in the urine. In the mild forms it is not only useless but may be harmful. Ex-

cellent results are obtained in the severe forms of the disease by this treatment, and it is sometimes possible to rid the urine of sugar when it could not be done under the standard diet. In some cases both the diacetic acid and sugar disappear from the urine, while in others the diacetic acid disappears but the sugar excretion is unaltered.

Lidwill recommends rye bread, which in Germany is called pumpernickel, in the glycosuria of old or middle-aged individuals. Its value possibly depends upon its "satisfying" the patient so that only a small amount is taken. The starch contained in it is not readily assimilated and it is laxative.

Von Mering emphasizes the necessity of individualizing in the treatment of diabetes. When the perchloride of iron reaction is present 100 to 150 grammes of bread daily with one liter of milk should be given, together with large quantities of sodium bicarbonate. Muscular exercise is beneficial not only in the mild cases but in the more severe forms. Muscular exercise causes a diminution of the sugar excretion, but great caution is necessary in severe cases of diabetes, and overstrain must be avoided, since sudden death may occur in such cases through cardiac failure. Massage should be employed in emaciated patients. The conclusions drawn as to the value of drug treatment may be wrong unless it is remembered that everything which diminishes the appetite reduces the sugar excretion. Opium is the only drug which influences the sugar excretion favorably, but its effects are temporary. When coma threatens large doses of alkalies, 450 to 750 grains daily of bicarbonate of soda, should be given, and milk, bread, and soup added to the diet. If coma occurs 750 grains of sodium bicarbonate dissolved in a liter of water should be injected into a superficial vein.

Simon points out that acetone will sometimes disappear from the urine when butter is excluded. He records three cases of severe diabetes in which withdrawal of butter from the food did not check the acetonuria nor diminish the diacetic acid. In these cases the addition of a large amount of albumin in the form of cheese with relatively large quantities of carbohydrate caused the acetone and diacetic acid to disappear promptly from the urine.

Treatment of Graves's Disease.—

DRESCHFELD, J. *Medical Chronicle,* vol. x, No. 4, p. 203, January, 1906.

The writer discusses some of the symptoms of Graves's disease and speaks of the difficulty in formulating a prognosis. A complete cure often results in the most aggravated cases. In one case, a girl of 20, whose pulse varied from 180 to 200, there was persistent vomiting, acetonuria, and a semicomatose condition; she made a complete recovery, though one eyeball suppurated. Many cases recover when put at once under hygienic and medicinal treatment. In others the symptoms in spite of treatment increase in severity for weeks or months, and then an improvement sets in, when the case has become chronic. An unfavorable prognosis is indicated in cases accompanied by pyrexia, profuse sweating, loss of appetite, associated with the more serious nervous symptoms. The disease in persons above 40 has a less favorable outcome than when it occurs in younger persons. It is not necessary to speak of the general treatment of the disease, such as rest, massage, electricity, and the various drugs that favorably influence certain of its symptoms. Thymus gland extract has given good results in the hands of some observers. The writer has seen little decided benefit from its administration. Adrenalin may possibly be of service in those cases in which the pulse tension is low. Some claim that thyroid gland extract is useful, and it appears to answer in some of the chronic cases in which the thyroid gland has undergone fibrous changes. A case while

taking the thyroid tablets improved, and after leaving them off for a time the symptoms became worse. In acute cases and in those with a soft pulsating thyroid the extract does harm.

For the employment of antithyroid serum of Moebius and the thyroidectin of Parke, Davis & Co. there is a rational basis. The antithyroid serum is spoken favorably of by continental writers, but English physicians do not claim to have had much success with it. The writer has given it in twenty-one cases. Of seven hospital cases three were cured, two much improved, and in two there was no effect. Of fourteen private cases seven were cured, four improved, and three were not benefited. Some of the cases which have improved are still under treatment, and some of the cases that improved still show exophthalmos, but are in other respects well. The serum is given by the mouth in 10-minim doses three times daily, and in the course of a week if there is no marked improvement the dose is gradually increased to 20 or even 25 minims. After the first few doses the subjective symptoms improve, and after some days the pulse and goitre improve and the tremor lessens. In many cases the serum treatment was combined with rest, massage, and liberal diet. If given in 20-minim doses no untoward symptoms are noticed, though patients should be observed, otherwise symptoms of intoxication may appear.

Treatment of Scars and Cheloid.—

Morris, M. *Practitioner,* vol. lxxv, No. 6, p. 775, December, 1905.

Cheloid and scars have been the despair of surgery. The former pessimistic attitude is not justified by later experience. The therapeutic advances of recent years have placed in our hands methods which will improve the most extensive and severe cases. Scars can be divided into the *atrophic,* such as the depressed scar in smallpox, and the *hypertrophic,* which is not a cheloid, but is always confined to the original limits of the destroyed tissue. Cheloid is a new growth intermediate between a scar and a sarcoma; there is formed a tough layer of connective tissue. Cheloid extends its boundaries by invasion of the neighboring skin. There seems to be an infective element in its formation.

When confronted with a scar one should decide whether treatment is necessary. Very large scars must be dealt with surgically. Small scars resulting from smallpox, chickenpox, acne, and lupus involve a loss of tissue with depression. If not painful and are inconspicious they should be left alone. Cheloid is sometimes so painful as to call for treatment, even when it causes no disfigurement. In cases of deep pitting by smallpox and the severe scarring from acne relief is obtained by stimulating applications, such as sulphur and resorcin ointments. These in time set up a reactive inflammation of the skin, which is followed by peeling of the horny layer; this levels the thickened edges of the pits and gives a smoother surface, which is less disfiguring. Cheloid is improved by frictions with ichthyol ointment 10 to 25 per cent. Marie recommended injections of creosote in olive oil (one to five parts) at a number of points. These injections are followed by inflammation and sloughing, and in this way the growth is removed piecemeal. The results of thiosinamin injections are confusing. Electrolysis has been used with fair success; a curved surgical needle attached to the negative pole is passed under the growth, and a current of 3 milliamperes is passed for twenty or thirty seconds. A combination of sulphur ointment and light rays has been used by Steiner, in this way obtaining a hyperemic reaction, with consequent absorption. Excision in cheloid is not to be recommended, as it is frequently followed by

recurrence, and sometimes the growth is greatly stimulated.

Cheloid sometimes undergoes a spontaneous evolution, and this may be mistaken for the effect of remedies, such as thyroid extract and arsenic. The writer is strong in the belief that the only relief comes through a local reaction. There are cases in which a masterly inactivity is best. When the face is affected the extensive removal of scars or cheloid is out of the question. In scars of moderate extent and bands of cheloid on the face, the Finsen light gives the best results. In treating lupus the light does not leave a scar, and it will often cure a scar caused by other methods of treatment. It does this by setting up a reaction which leads to absorption.

The Sanatorium Treatment of Pulmonary Tuberculosis.—

Lancet, vol. i, No. 1, p. 1, Jan. 6, 1906.

The *Lancet* publishes a symposium on the therapeutic and economic aspects of the sanatorium treatment of pulmonary tuberculosis. The increasing interest of the lay public in the question of sanatorium treatment of tuberculosis makes it important that there should be some authoritative statement from those who are qualified to speak on this subject. A number of questions have been propounded upon which leading authorities have been asked to write.

Richard Douglas says sanatorium treatment supplies the hygienic conditions upon which all therapeutic measures must be based. The keynote of the treatment is the maintenance of the patient in an aseptic atmosphere. While there is room for improvement in the sanatorium treatment there is none for retrogression from it. The sanatorium treatment need not necessarily be carried out in sanatoriums. But few people, even among the well-to-do, can command conditions of locality, house facilities, space, nursing, and medical supervision in the same perfection that they can be obtained in a sanatorium. For the working man the sanatorium is essential. There must be a well recognized understanding of what is accomplished by the sanatorium treatment of consumption. The majority of patients cannot return to the conditions under which they have broken down. They must think out and their friends must help them to a new line of life. The sanatorium only gives time and better health to reorganize the future mode of life. The necessity of economy in construction with ample ground space is insisted upon.

Sir W. H. Broadbent expresses great confidence in the sanatorium treatment, but states that everything depends on the skill and care with which the treatment is adjusted to individual cases. The sanatorium experience of Germany in relation to the industrial classes is very favorable. The problem of the working man is to provide for his family while he is treated. The compulsory insurance does not lend itself to industrial conditions in England, and the question of insurance is a difficult one. Industrial colonies are needed after sanatorium treatment. Sanatoriums serve two distinct purposes—the arrest of the disease in early cases, and the prevention of its spread by advanced cases.

J. K. Fowler and F. J. Wethered also discuss the therapeutic value, and Arthur Latham discusses the economic value. He says that sanatoriums are essential in the treatment of tuberculosis, and that if properly used they are an important part of a coördinated system leading to the eradication of tuberculosis.

Action and Uses of Digitalis in Cardiac Failure.—

Bruce, J. M. *British Medical Journal,* p. 8, Jan. 6, 1906.

An analysis of a case is given which illustrates the importance of studying the amount of urine when administering this drug. A patient was admitted to the hospital with

marked cardiac incompetence. He was placed on the ordinary dry diet. The amount of the drug was gradually increased for several days, and when the dose of the tincture of digitalis was raised to 15 minims every four hours the amount of urine was raised from 23 to 70 fluidounces, subsequently going up to 180 ounces. If good results would be obtained from digitalis in cardiac failure it should not be given in moderate doses. Ten minims of the tincture every four hours will suffice in the majority of cases, but there are instances in which it is required in larger doses. The discredit into which digitalis has fallen may be in part due to the fact that it is given in too small doses. Digitalis has what may be called a cumulative action. No matter what the size of the dose it will take a considerable time to develop its diuretic effect. After compensation has been restored, then the non-medical measures for sustaining cardiac efficiency must be employed. In using digitalis in cardiac insufficiency emphasis is to be laid on the importance of measuring the urine. The volume of the urine is a sufficient index of the patient's condition and progress. There may be doubt as to the character of the pulse or of the physical signs and symptoms, but the quantity of the urine can be accurately measured, and its variations are a delicate index of the progress of the case and afford the most striking indications for the administration of digitalis.

Excision of the Superior Cervical Ganglion in Inflammatory Glaucoma.—

FOSTER, M. L. *Annals of Ophthalmology,* vol. xiv, No. 4, p. 638, October, 1905.

Excision of the superior cervical ganglion of the sympathetic for glaucoma is an operation that has not yet obtained an assured place. It is only seven years since it was first performed. The literature regarding the operation is still conflicting. It shows many brilliant results and some failures. A case of simple glaucoma with normal tension and no signs of inflammation came under the writer's observation. A weak solution of eserine was employed for constant use. For a time the condition remained unchanged, when shortly after the removal of a foreign body from the conjunctiva there was an increase in the inflammatory process with heightened tension. An iridectomy was performed on each eye. The left eye made a good recovery, but three days after the iridectomy there was an attack of acute glaucoma in the right eye. Hot applications and eserine were of no avail. The eye was seen in consultation, and the advice varied from letting the eye alone to immediate enucleation. In the hope of reducing the tension the cervical sympathetic was divided. Sixteen hours after the operation there was a slight ptosis of the upper lid. There was less redness of the eyeball, but the tension was unchanged. After a time the tension became normal, the eye recovering with slightly improved vision. The result in this case showed that the glaucoma was probably not due to any pathological condition in the cervical sympathetic.

Saline Solution in the Treatment of Pneumonia.—

TAYLOR, J M. *Medical Record,* vol. lxix, No. 2, p. 48, Jan. 13, 1906.

The writer bases his belief on the value of saline solutions in the infectious diseases on the physiological observation that there is an enormous loss of the plasma and of the saline constituents of the blood plasma in the acute infectious processes. A few observers have called attention to the value of saline solutions, but they have recommended their use late in the disease, and in desperate cases they should be employed from the outset as soon as the disease is recognized in order to maintain the bactericidal efficiency of the blood. Saline solution used early preserves the normal fluid

of the blood and gives free play to the immunizing process. Delay in the use of salines is just as dangerous as delay in administering antitoxin in a case of diphtheria. The blood suffers such a rapid loss of saline elements with a consequent impairment of its efficiency that there is a final arrest of the protective functions of the organism. A practical recommendation is to begin at the outset in pneumonia and other infectious fevers the internal use of saline solutions, especially those containing sodium chloride and other saline constituents of the blood. They may be used hypodermically or by enema, but saline drinks are quite as efficient and are not so inconvenient or disagreeable.

The Salts of Calcium in Certain Headaches.—

Ross, G. W. *Lancet,* vol. clxx, No. 3 of vol. i, p. 143, Jan. 20, 1906.

The salts of calcium are claimed to relieve headaches which have a certain distinctive characteristic, the most important of which is a deficient coagulability of the blood. This form of headache is most severe on waking, and tends to lessen in intensity or altogether disappear in from one to six hours. It usually manifests itself as a dull, heavy ache, or as a frontal or temporal throb. Less often it is occipital, vertical, or unilateral. Infrequently it is neuralgic. In its most typical form it is chronic, often of several years' duration, and most intractable. It also exhibits itself as the common occasional headache. The subjects of the chronic form of this headache are usually of the lymphatic type. The expression is heavy and listless, the face is full, and the eyes are often puffy. Some anemia is the rule, and it varies in intensity from a slight paleness to an actual chlorosis. The associated symptoms are alimentary disturbances, such as anorexia and constipation. There is frequently cough, shortness of breath, with palpitation and hemic murmurs, and disturbances of the skin, such as chilblains, urticaria, and edema. The latter symptoms especially have been noted as occurring where the coagulability of the blood is lowered and there is deficiency in the salts of calcium.

The histories of fourteen cases are given in which calcium lactate cured the headache. The lactate of calcium is given in 15-grain doses combined with a small quantity of capsicum and chloroform water. The lactate is far more palatable than the chloride. In the less severe type considerable relief is felt from within one-half to one and one-half hours after the giving of the calcium salts. In others the relief comes within the first twenty-four hours, and usually the headaches disappear after the fourth day. It is desirable to give one or two pints of milk a day, though it is not essential. Oysters, crabs, malted liquors, and wines should be avoided.

The Actual Cautery in Leucorrhea.—

Hunner, G. L. *Journal of the American Medical Association,* vol. xlvi, No. 3, p. 191, Jan. 20, 1906.

The treatment consists of deep radial incisions made in the cervical tissues by a cautery blade. The procedure is carried out with the patient either in the dorsal or lithotomy position. A broad-bladed Sims speculum is introduced, and the anterior lip of the cervix is pulled down as far as possible. The strokes are made one at a time; after each the cautery is removed from the vagina, as otherwise the heat is too great. The procedure can be carried out without pain unless there exists a painful cervical scar. In these cases a local anesthesia can be produced by a tampon soaked in a 20-per-cent cocaine solution applied for ten minutes. The number and depth of the strokes vary with the conditions. They are usually six in number, the depth varying from 2 to 5 millimeters. The treatments are given once in three weeks, and usually number from three to six. A sterile strip

of gauze is left in the vagina to guard against possible hemorrhage. If the latter occurs the patient should go to bed. A daily douche is advised during the intervals between treatments. The importance of a careful diagnosis before the treatment is instituted is emphasized. If there is suspicion of cancer the services of an expert pathologist should be secured. In fresh gonorrheal cases the cautery is not used, nor anything that will extend or excite a cervical infection. In chronic gonorrhea it is well not to persist too long with the cautery or cervical treatment as there may be infection higher up. Cases not extending above the cervix may be considered curable. The quickest and best results are obtained in cervical hypertrophy and eversion due to multiple childbirth. An advantage of the method is that it can be used in office practice without anesthesia.

Static Electricity in the Treatment of Prostatitis.— Snow, W. B. *Medical Record,* vol. lxix, No. 2, p. 57, Jan. 13, 1906.

The writer has treated about forty cases of prostatitis with static wave current and vacuum tubes. In every case some improvement was noted, and in 75 per cent of the cases there was complete relief from the symptoms. The technique of the method is described, and several special electrodes which have been devised by the author are mentioned. The good effect of the treatment is attributed mainly to the mechanical contraction, which is efficient in relieving simple congestion in the early stages of the affection. When the gland has been enlarged for a number of years and there is much infiltration and vesical irritation, improvement in the symptoms can be effected, but the hyperplastic tissue will still remain. In those advanced in years in whom the gland has become greatly enlarged the inflammatory process may be abated, affording relief to the obstruction. The dilatation of the bladder may be relieved or even cured by the persistent application of the electrical current over the pubes, and by an electrode carried high into the rectum and pressed against the bladder, together with irrigations and the use of strychnine. The current used in this manner causes a temporary contraction of the muscular cords and finally restores sufficient tone to enable the organ to empty itself.

Sodium Lactate in Nose and Throat Operations.— Harris, T. J. *American Medicine,* vol. x, No. 27, p. 1102, Dec. 30, 1905.

The frequency of intoxication with cocaine hydrochlorate has led to a study of beta-eucaine lactate. It does not shrink the tissues, which is of advantage in examining polypoid growths. If such contraction is required eucaine may be combined with adrenalin. Eucaine lactate can be used in a 25-per-cent solution. He has used it in about fifty cases, including eight for correction of the nasal septum, both by Roe's and Freer's method; in these cases it was used in 10- to 15-per-cent aqueous solution applied on cotton for about ten minutes. It was combined with or followed by 1-in-5000 adrenalin solution. Just before operating 20 to 30 minims of a one-per-cent eucaine solution combined with adrenalin (eucaine lactate 8 grains, sodium chloride 21 grains, boiling water 14 drachms, adrenalin 18 minims) was injected into the mucous membrane of the nasal septum. Little pain was complained of, and in most there was none at all. Once a 25-per-cent solution was used for removing extensive tuberculous infiltration in the larynx by means of the galvanocautery. This is a painful procedure and requires complete local anesthesia. During the operation the patient felt no pain. The removal of adenoids in an adult was accomplished under eucaine lactate, as well as the removal of a middle tubinate, without pain.

The impression gained by the writer in this

series of cases is that eucaine lactate is an excellent substitute for cocaine and may be employed in strong solutions. It does not deteriorate under the usual periods of office use. Its anesthetic power is not so great as that of cocaine, and in the most painful operations on the nose it is best used in a correspondingly stronger solution. A 15- to 20-per-cent eucaine lactate solution should be used in cases in which 10-per-cent cocaine is commonly employed.

Sodium Aurate.—

VERHOEFF, F. H. *Journal of the American Medical Association,* vol. xlvi, No. 4, p. 270, Jan. 27, 1906.

Ever since the advent of bacteriology there has been an earnest search for the ideal antiseptic. Such should have the power to destroy pathogenic germs without injury to the host. It is needless to say that this ideal antiseptic has not been found. That it never will be found is a statement that goes too far, but when we remember that germs are composed of a protoplasm not very different from that of the animal cells, it will be seen how difficult it is to reach the germ and not affect the tissues. One of the latest candidates is sodium aurate. In preparing the solution of this substance 15 grains of commercial chloride of gold is dissolved in 50 cubic centimeters of distilled water. To this is cautiously added a five-per-cent solution of sodium hydrate until the solution is faintly alkaline. To this is quickly added 100 cubic centimeters of a one-per-cent boric acid solution, and the whole thoroughly shaken. The total volume should then be made up to 200 cubic centimeters with normal saline solution. It should be filtered and kept in a glass-stoppered bottle. When prepared in this way the solution may be repeatedly dropped in the conjunctival sac without causing irritation or hyperemia. The solution is said to be a more powerful antiseptic than a 1:1000 solution of mercuric chloride. The writer thinks it can safely be used in the treatment of diseases of the eye and of the genito-urinary tract. While it is largely devoid of local irritating properties, the effect of absorption of considerable quantities has not been tested.

The Tonic Alterative Action of Copper and Arsenic in Primary and Secondary Spanemic Cases.—

BUTLER, G. F. *Lancet-Clinic,* vol. lvi, No. 2, p. 40, Jan. 13, 1906.

The term spanemia has been adopted as a substitute for anemia, as it indicates a deficiency of certain elements in the blood. The prevailing conception of anemia suggests iron as the proper remedy. Copper has of late been described as a violent poison, but such is not the case in the older dispensatories. It was recommended as an alterative tonic useful in epilepsy, chorea, and other spasmodic conditions, especially those connected with debility. According to late therapeutic writers, in small doses it stimulates both the heart and capillary circulation and is a general nerve tonic. It is of value in chlorosis, anemia, and the cachectic states. In syphilis it was found to be useful, the best results being obtained from small doses frequently repeated. The copper arsenite is the preferable salt, and under its use both digestion and nutrition improve. It is superior to Fowler's solution in chorea and similar neuroses. In the secondary anemia resulting from malaria copper will be found to give results when arsenic and quinine fail.

Diphtheria Antitoxin in Scarlatina.—

LOPEZ, J. H. *American Medicine,* vol. xi, No. 4, p. 144, Jan. 27, 1906.

Attention is called to the value of diphtheria antitoxin in scarlatina. This was first noted about three years ago in an orphanage containing 300 children when the scarlatina followed an outbreak of diphtheria. To guard against the dangers of mixed infection and for

immunizing purposes antitoxin was liberally employed. It was noted that the results were very favorable in non-diphtheric cases. A few of those under observation may have been of a mixed type, but most of them were simple scarlatina. In every case the results of the diphtheria antitoxin were favorable, and were especially noticeable where there was marked throat involvement. Early curative doses of antitoxin abort the disease and lessen the suffering and risk. The average dose of 2000 units is sufficient to abort the disease, and there are no contraindications in the anginas of scarlatina. The antitoxin aborts the febrile reaction and improves the local conditions. Not only were these effects noted in institutions, but they have been repeated in private practice. In the uncomplicated scarlatina the serum is distinctly curative.

THERAPEUTIC BREVITIES.

Roentgen Ray Treatment in Leprosy.—

H. B. Wilkinson (*Journal of the American Medical Association,* Feb. 3, 1906) has employed the *x*-rays in the treatment of leprosy in a number of Filipinos. Three of the cases were cured, seven markedly improved, and in three there were no results. One of the cured cases has since died, and a careful examination of the body showed not a trace of leprous infection. The best results were obtained in the hypertrophic forms of leprosy. Under the *x*-ray treatment there was a rapid shrinking of the morbid tissues, and associated with it was an improvement in the parts not directly irradiated. This is explained by the theory that the destroyed leprous bacillus develops a substance which is toxic to the living bacilli. In patients with diffuse general involvement, or in whom there were only a few scattered germs, the clinical type being the atrophic form, there was little success. In two well advanced cases with excessive new leprotic tissue the improvement was marked and rapid, but was accompanied with a deterioration of the general health and rapid physical decline. This may have been the result of an overdosage of necrotic elements.

Esculin in Phototherapy.—

George H. Graham (*Lancet,* Dec. 16, 1905) has used esculin in connection with the Finsen light treatment in lupus vulgaris. Esculin has a greater degree of fluorescence than any other substance. It is a glucoside obtained from the inner bark of the horse-chestnut (*Æsculus Hippocastanum*). The substance is readily dissolved in boiling water, but it coagulates upon cooling. The latter is prevented by the addition of 2 or 3 per cent of sodium carbonate. In two or three days the solution turns dark, and it should therefore be freshly made. It seems to be quite devoid of physiological effects, the writer having taken a hypodermic injection of five-per-cent solution. No pain was caused, nor did any constitutional disturbance follow. Fifteen minutes after the injection the urine showed slight evidence of fluorescence, and within an hour the fluorescence was marked, and it persisted for four days. That the fluorescence does take place in the tissues the writer demonstrated by partly removing a section of skin and muscle from a rabbit and then exposing it to the Finsen light. In this way the fluorescence of the tissues could be distinctly seen. A very small dose is all that is required. From one to five minims of a five-per-cent solution may be used hypodermically. The needle is passed just through the skin, and the injection is made immediately under the spot to be treated. The reaction following an ordinary Finsen application is usually over by the third day, but if sensitized with esculin it may last from four to seven days. The

writer has given over 100 injections with no ill effects. The method was especially useful in cases of indurated nodules which did not readily clear up. The same treatment has also been found useful in fibrous scars similar to keloid. The action of esculin is probably purely physical.

Acetozone in Cerebrospinal Meningitis.—

L. S. DeForest, in a letter to the *Journal of the American Medical Association* of December 16, 1905, says that he has used an acetozone solution, injecting it into the spinal canal in two cases of cerebrospinal meningitis. The cases were severe and protracted, the results being apparently favorable. In both cases puncture had already been required to relieve urgent pressure symptoms. The lowering of the cerebrospinal pressure had no effect on the temperature. After an injection of a weak solution (5 grains to the quart) the temperature promptly subsided and remained nearly normal. The patients were aged 7 and 4 years respectively. In the first case 30 cubic centimeters of fluid was withdrawn and 15 cubic centimeters of the acetozone solution injected. In the second case 35 cubic centimeters of the fluid was withdrawn and 15 cubic centimeters injected. In the acute fulminating cases, in which death takes place before the formation of much fluid, such an injection would probably be difficult. It is possible that stronger solutions can be used.

Treatment of Soft Chancre.—

E. Welander (*Wiener klin. Woch.,* Nov. 19, 1905) says that well attested clinical observations show that in chancroids, if the temperature of the body rises to 103° and above, there will be a marked improvement in the local infection. This observation has led to the application of continuous heat in the treatment of chancroidal and phagedenic ulcerations. A local temperature above 40° C. effectually destroys the organism responsible for these processes. He describes a rather complicated apparatus for continuous irrigation. Such an apparatus would almost of necessity be restricted to hospital use. A similar though less efficient result can be reached by immersing the part in water of as high a temperature as can be borne for short periods during the day. It would seem that quite as efficient results might be obtained by the use of a hot-water bag, with which the local temperature of a part can be kept considerably above normal for long periods of time.

Automobile Spark Coils and Dry Cells for Exciting Vacuum Tubes in Treating Skin Diseases.—

W. Rollins (*Boston Medical and Surgical Journal,* Dec. 28, 1905) in a previous paper has shown that vacuum tubes for the treatment of skin diseases could be efficiently excited by an apparatus costing but a fraction of the expense of those now in use. Attention is called to a still less expensive apparatus made for a patient who lived where no commercial electric current was available. It consisted of a spark coil of a motor car, costing $8, and of two cells of dry battery, costing 40 cents. This apparatus makes the home treatment of some skin diseases by radiations under the direction of a physician both practical and inexpensive.

The Treatment of Earache.—

A. Bardes (*Medical Record,* Jan. 20, 1906) calls attention to the importance of this symptom, which should be treated as soon as it occurs. The patient should be kept quiet, preferably in bed, and placed on a fluid diet. The bowels should be kept open, and a single dose of morphine may be given to insure rest and comfort. Dry heat or an ice-bag may be applied to the ear. Every three hours the ear should be gently irrigated with a hot solution of bichloride, 1:5000, after which a few drops of a two-per-cent solution of carbolized

glycerin can be instilled. Under no circumstances should a person be allowed to suffer pain longer than twenty-four hours. If the pain continues and the drumhead is distended, palliative measures are worse than useless. A bulging drumhead should be freely incised.

Treatment of Acne.—

E. Moschowitz (*Medical Record,* Jan. 13, 1906) has applied Bier's method to the treatment of acne. It consists in the application of dry cups to the affected region for one-half hour once or twice a day. The suction is slight, and the cup is removed and reapplied every one or two minutes. From two to five applications must be made over the same area before improvement is effected. The method does not prevent the appearance of new pustules, though they become less frequent. Eight cases were treated by this method alone with satisfactory improvement.

Deep Injections of Alcohol in Obstinate Neuralgia.—

Ostwalte (*Presse Médicale,* Dec. 16, 1905) claims that injections of alcohol are useful in obstinate cases of neuralgia. He injects seven minims of an 80-per-cent solution into or as near the trunks of the nerve as the needle can be introduced. There is added to this a little cocaine or stovaine. The claim is made that the injections are harmless and have never been followed by untoward results. He has employed as many as 250 injections in cases of tic-douloureux.

Adrenalin in the Peritoneal Cavity.—

E. Marvel (*Journal of the Medical Society of New Jersey,* December, 1905) calls attention to the value of adrenalin in the peritoneal cavity. It controls peritoneal oozing and tends to prevent the formation of hemorrhoids. If shock occurs while the abdomen is open an intravenous infusion of adrenalin may be given.

MEDICINE.

Experimental Studies of Syphilis.—

METCHNIKOFF and ROUX. *Annals of the Pasteur Institute,* vol. xix, No. 11, p. 673, Nov. 25, 1905.

This fourth memoir contains an amplification of work done at the Pasteur Institute, to which reference has been made in previous publications, by which it has been shown, through experiments upon a large number of representatives of the different groups of simian animals, that syphilis is transmissible to some, though not to all, of them. It is most easily transmissible to the chimpanzee, in which animal the disease presents the greatest analogy to human syphilis. Metchnikoff's observations have now included inoculations made upon twenty-two chimpanzees, three gorillas, three orang-outangs, and 120 other monkeys. The receptivity of the chimpanzee is fully established. Out of twenty-two experimental inoculations with syphilitic virus of diverse origins made into chimpanzees not a single failure has to be recorded. In every one satisfactory manifestations were obtained, the incubation period varying between fifteen and forty-nine days, with an average of thirty-two days.

The occurrence and appearance of the primary lesion in chimpanzees have been described in the preceding memoirs, and in this communication the secondaries are more particularly dealt with. These begin, after a varying incubation period, with tumefaction of the lymphatic nodes of the neighboring region. In one chimpanzee, upon which an autopsy was performed, a number of hypertrophic nodes were found in the abdominal aorta and the iliac artery. Of the twenty-two chimpanzees inoculated, eight showed distinct secondaries—three in the form of mucous patches. Papules, both dry and necrotic, were observed in seven chimpanzees, of which two showed mucous patches. Several developed

characteristic palmar psoriasis. The incubation preceding the secondaries—that is, the period intervening between the appearance of the primary lesion and that of the secondary—varied between nineteen and sixty-one days, average thirty-three days. Of the fourteen chimpanzees that did not develop secondaries, four were inoculated with virus that had been passed through Chinese macaques (*Macacus sinicus*), the virus being distinctly attenuated by this treatment. One of these died 118 days after the appearance of the primary lesion; so that there was plenty of time for the development of secondaries. Of the other three, one died twenty-seven days, and the other eleven days, after the development of the primary lesion; and the third is still living, forty-two days after the local manifestations. This one may yet develop secondaries. Four other chimpanzees died without secondaries within the period of incubation. There remain four chimpanzees that survived the appearance of the primary lesions for a time sufficiently long to develop secondaries, in whom none have appeared. One of these was inoculated with virus taken from a Java macaque (*Macacus cynomolgus*), and had been previously treated with chimpanzee virus destroyed by heat; a second, having waited forty-five days, was inoculated with virus from a syphilitic chimpanzee; and the third, inoculated with human virus, had been treated with the serum of a monkey (papion) immunized against syphilis. The fourth chimpanzee had been treated with a syphilitic virus of human origin filtered through a Berkefeld filter.

There remain four individuals against eight which present secondary lesions of different nature; which shows that chimpanzees are subject to secondaries in the proportion of 66 per cent. In most other cases the secondaries were not of great extent or gravity. They consisted of dry, ulcerated papules sparsely disseminated upon the body, as well as mucous patches in the mouth. These lesions persisted for some weeks, then got well, leaving cicatrices. In a few cases the secondaries assumed a grave character. One inoculated with human virus developed after thirty-seven days a series of chancres at the point of inoculation. In about a month four papules appeared on the face, which healed after two weeks, leaving non-pigmented, marked cicatrices. Soon afterward numerous papules of a brown color appeared on the skin of the belly. In the following days the number of the papules augmented considerably. Some weeks following the number increased on the belly, and on the palmar surfaces of the hands and feet dry patches of syphilitic psoriasis made their appearance. During the five months of the secondary period the hair fell out all over the body. The denuded skin showed numerous papules covered with a quantity of white scales. Still later the lesions ulcerated and could be seen from a considerable distance. During all this time the animal did not manifest any trouble with the general health, but progressively emaciated. Fournier, who observed this chimpanzee, declared from the first that the animal was suffering from malignant syphilis, and made a prognosis that the animal would die. This happened six days after his visit, the animal falling into a profoundly cachectic condition. Bacteriological examination of the ulcerated papules showed a quantity of different bacteria with a predominance of cocci, so that it seemed probable that the syphilitic lesions on the skin were secondarily infected. This supposition is corroborated by the fact that a second syphilitic chimpanzee living in the same compartment presented at the same time similar cutaneous lesions. Two chimpanzees showed nervous lesions of some interest, one case terminating in paraplegia.

The gorillas and orang-outangs did not

prove to be so suitable for the experimental study of syphilis as the chimpanzees. Of 120 experiments upon monkeys of various kinds, inoculated with virus of various origins, secondary lesions were observed in none; but in a few after the healing of the primary lesion a cutaneous eruption somewhat resembling lupus was observed to make its appearance on the skin in the neighborhood of the primary lesion. The supposition that these lesions were tuberculosis, secondarily engrafted upon the syphilis, has not been confirmed; and inoculation experiments made with guinea-pigs have shown nothing. Enlargement of the lymphatic nodes in the neighborhood of the chancre is very rare. Sometimes the ganglia appeared slightly tumefied.

Having shown that monkeys are susceptible to syphilis, a second part of the memoir is devoted to an experimental study of the methods by which the infection can be modified or prevented.

Our knowledge of human syphilis might lead one to suppose that immunity against the disease can be established with ease, but prolonged experimentation has shown the inaccuracy of this supposition. Frequent attempts have been made by others to apply the principles of serum therapy so as to prepare an antisyphilitic serum, but they have usually been so discouraging as to be almost entirely abandoned; and at the present time they seem to be continued only by Maragliano, of Genoa.

It occurred to the writers that perhaps the smaller monkeys, which are best adapted to the temperate climate, and which are capable of contracting the primary lesion of the disease, from which they recover perfectly in a short time, might be more appropriate for purposes of treatment and immunization than horses or other domestic animals. They therefore inoculated various macaques and other monkeys with syphilitic virus, and after allowing them to recover from the chancre, inoculated them upon numerous occasions beneath the skin with blood taken from persons suffering from syphilitic reseola, it having been established by experience that in this stage of the disease human blood is virulent. They have confirmed these results by injecting into a macaque some blood of the chimpanzee taken at the time when it was developing secondary lesions. In spite of the fact that all of the animals were so treated and submitted to immunization as long as fifteen months, the results obtained up to the present time are far from being satisfactory.

A number of interesting examples are introduced to show how these immunization experiments were performed and the unsatisfactory results obtained. Having shown that such experiments are of no value, the subject of prophylaxis by means of other treatments is next discussed. In a series of experiments, after the inoculation of syphilitic virus the part inoculated was dusted with a powder prepared by drying the serum of immunized monkeys; but the effect of this treatment was not constant, and even when combined with the serum therapy gave disappointing results. It seems certain that to secure preventive action it will be necessary to have very much stronger serum than can be obtained at the present time.

The well known fact that materials secured from tertiary lesions of syphilis are very rarely infectious suggested that these tertiary products might have a vaccinating power. Salmon made a number of experiments at the Pasteur Institute to determine whether material obtained from gummatous lesions would communicate syphilis to monkeys, and obtained negative results; but Finger and Landsteiner report two successful inoculations of monkeys with material obtained from a gumma. The writers inoculated a chimpanzee with material from a gumma, and observed that the animal

remained well for thirty-seven days, after which it was inoculated with virus from a chancre upon another chimpanzee. Thirty days after this second inoculation a typical primary lesion formed, showing that the material from the gumma had no vaccinating influence. Attempts were also made to produce immunity by the introduction of heated virus, but these were also unsuccessful. Lastly, an endeavor was made to destroy the virus introduced into the body by the application of antiseptics and mercurial ointments. It was found that mercurial ointment was quite irritating, and that when it was applied within an hour of the vaccination the virus was destroyed and no infection took place, but it was also observed that no immunity followed, since no infection had been produced. The animals were subject to subsequent inoculation with virulent material.

The last part of the memoir concerns the microörganism of syphilis, in which the writers declare that they have at last discovered the microbe of syphilis, accepting the spirochaeta, or as they prefer the spironema, pallida of Schaudinn and Hoffmann. This organism is accepted for the following reasons:

1. Because of its constant presence in the primary and secondary syphilitic lesions of human beings.

2. Because it is found with equal frequency in various countries far removed from one another, as Europe and America.

3. The presence of these organisms in syphilitic new-born infants.

4. The presence of the organisms in the blood.

The fact that one occasionally fails to find it, and the additional fact that it bears a close resemblance to other microörganisms, is not thought to militate against its importance; because there is a striking resemblance between the tubercle bacillus and the lepra bacillus morphologically and tinctorially, yet it is well recognized that they are quite different organisms; and because the failure to demonstrate tubercle bacilli in such tuberculous lesions as lupus, where they are exceedingly few in number, is now known not to disprove the tuberculous nature of lupus. The number of cases in which the organism has been found is taken to be sufficient. All told, they examined thirty-one monkeys, finding the organism in twenty-three cases, or 74 per cent. Their failure to find them in 26 per cent of these cases is believed to depend upon the hurried way in which their observations were carried out by the study of four stained cover-glasses from each case. They believe that if they had studied five or ten cover-glasses from each case they would have found the microörganism every time. Lastly, they expressly state that in all these experimental studies of syphilis they have never found in the lesions either the spirochaeta refringens or any other spiral organism, excepting that of syphilis.

The Intestinal Origin of Pulmonary Tuberculosis.—CALMETTE and GUERIN. *Annales de l'Institut Pasteur,* t. xix, No. 10, p. 601, Oct. 25, 1905.

In a number of recent communications von Behring expresses the opinion that pulmonary tuberculosis of the adult is never contracted through the respiratory apparatus, but is almost always the result of an intestinal infection occurring at an early age and developing later. The writers have for a number of years studied this question of the origin of tuberculosis, and have chosen for the purpose of their experiment a goat. They have shown that young goats nourished by mothers rendered artificially tuberculous by inoculation with different cultures so that tubercle bacilli appear in the milk always contracted tuberculosis of the intestine. In all cases in which the affection was produced by bovine bacilli the young

animals presented enlargement of the mesenteric glands and caseous tubercles, and the pulmonary lesions, more or less widely distributed, extended to the mediastinal and peribronchial glands. In all these cases the retropharyngeal glands remained unaltered. When the infection of the mother had been brought about by human tubercle bacilli, they observed only mesenteric tuberculosis without extension to the lungs. The same thing was true when the infection was made with avian bacilli. A number of interesting experimental observations upon the mode of development of tuberculosis in young and old animals follow, and the authors conclude from their investigations that the rôle that the inhalation of dust plays in the propagation of tuberculosis has been greatly exaggerated, and that dusts are infectious not because they are inspired but because they are swallowed.

A Case of Hematochyluria.—

WHERRY, W. B., JR., and MCDILL, J. R. Bureau of Government Laboratories, Bulletin Biological Laboratory, No. 31. Manila, May, 1905.

On May 30, 1904, O. Saya, a Japanese girl 22 years old, came under observation. She had come to Manila four years ago from a village near Nagasaki, was emaciated, pale and weak, and complained of passing bloody and milky urine and of attacks of abdominal pain, referred chiefly to the right lumbar region. She claimed to have always drunk boiled water or tea, and gave a history of good health. She was passing a considerable amount of peach-colored urine, sometimes quite bloody, which upon cooling contained large and small clots of reddish-yellow, jelly-like material. In the centrifugal precipitate a number of filaria-like organisms were found, but as none were observed in the peripheral circulation during the day or at night, the patient was put on tonics and local treatment consisting of boric irrigations of the bladder and one gramme of urotropin three times a day. On July 23, at 9 P.M., filaria resembling those occurring in the urine were found in the blood of a finger. The patient was kept in bed, the foot of which was elevated, and treatment continued by the use of adrenalin and methylene blue. At the suggestion of W. E. Musgrave an attempt was made to sensitize the adult parasites by the administration of quinine, followed by the exposure of the body of the patient through the lumbar region to the *x*-rays. On October 2 the skin over the chest and abdomen became reddened and swollen. A chill and left pleurisy developed. About 600 cubic centimeters of straw-colored fluid was evacuated October 8. The skin was scarlet all over the body. The urine was thick and bloody, but on October 10 became normal and remained so. By October 22 the patient had gained considerable strength, and several more applications of the *x*-rays were made. The patient had no return of the chyluria. The embryos still persist in the blood, and it is unlikely that the treatment had any effect upon the adult parasites.

In closing their communication the authors refer to the brilliant observations of Manson, Bancroft, Low, and James, which tend to convince one that the disease is transmitted by the bite of certain mosquitoes, but the following facts are pointed out as throwing some doubt upon this: A number of persons can live for years with a filariated patient, when apparently a favorable intermediate host is present throughout the year, without acquiring the disease, and Europeans enjoy a relative immunity when careful about their food and drink. This raises the old question whether Manson may not have been correct in his original assumption that the filaria escape from the mosquito to some watery medium and then gain entrance to the definitive host.

Non-tuberculous Joint Lesions.—

MEISENBACH, R. O. *Buffalo Medical Journal,* vol. lxi, No. 6, p. 335, January, 1906.

The joint conditions commonly classed as chronic rheumatism, gout, and arthritis deformans may frequently be grouped under different types which have a distinct course and yield to essentially different treatment.

Chronic villous arthritis is generally spoken of as the dry hyperemic or relaxed joint. In its simplest form it is a local process and may or may not complicate other types of joint disease. It may be present in any joint, but is most marked in the knee. It begins by a swelling of the affected joint, with local pain and tenderness. In both active and passive motion there is crepitus or creaking in the joint, and quite often there is a sudden check to motion or a locking takes place. The joint structures are usually relaxed, and there is a flabby condition of the synovial membrane. This protrudes into the joint and may mechanically obstruct its movement. The rubbing together of the folds of flabby synovial membrane causes crepitation, and the continued use of the joint causes a passive congestion, and villi or fringes form. These may separate in the more chronic condition, forming a loose body in the joint. This process does not tend to involve other joints, but it may exist simultaneously in more than one. Its causes are joint strain, or it may result from a general diathesis following a lowered vitality. The treatment consists in early stimulation with partial fixation. If the changes are due to faulty attitude it should be corrected.

In atrophic or rheumatoid arthritis there is early atrophy of the articular and periarticular structures. It is a progressive disease, first attacking one joint or a group of joints, and then involving others. The disease commonly begins by a swelling of the affected joints, followed by the atrophy, which later involves the bones and finally the soft structures around the joints. Villous arthritis often accompanies the early stage of atrophic arthritis, and there may be crepitation and excess of fluid, but this soon disappears as the atrophy increases. The disease usually begins in the metacarpophalangeal joints, and in the course of time involves the

FIG. 1.—Atrophic arthritis. Showing apparent swelling, but real atrophy and telescoping of the metacarpophalangeal joints.

knees, shoulders, and other joints. The ankylosis in rheumatoid arthritis is fibrous. The treatment is constitutional and should consist in tonics and the abundant ingestion of fats. Meats should be given freely. The diseased joints should at first be rested, and later have active and passive motion. As the disease advances the patient should be instructed to use the joints, which should be stimulated by massage and hot fomentations.

FIG. 2.—Atrophic arthritis. Showing atrophy of the cartilage and the beginning atrophy of the bones, with telescoping of the articular ends of the bone. (Goldthwait.)

Hypertrophic or osteoarthritis may be a local or general process. In this disease there is thickening of the edges of the articular cartilages, forming ridges or nodes, which subsequently undergo ossification and interfere

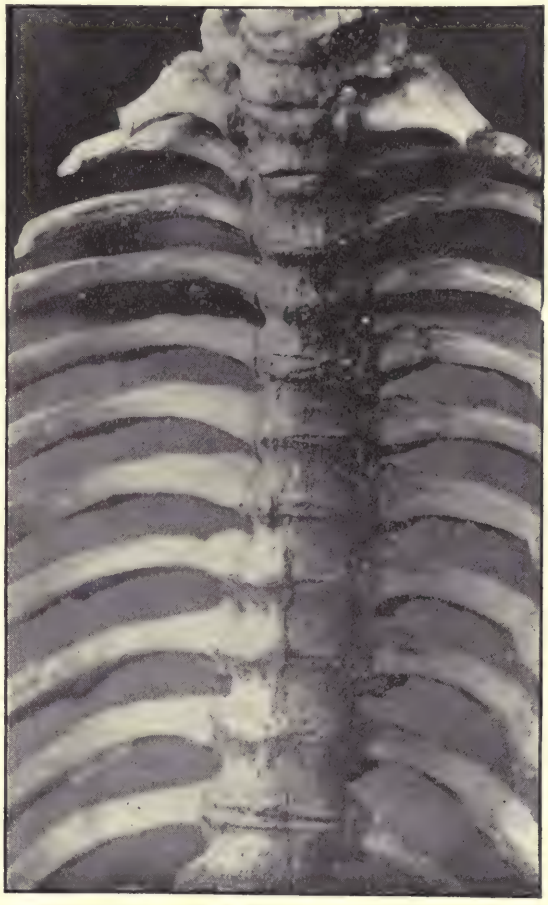

FIG. 3.—Hypertrophic arthritis. Showing ossification of intervertebral disks and the overlapping of hypertrophied bone. (C. F. Palmer.)

with motion. As the process extends the cartilage at the points of pressure is absorbed, being replaced by bone. The symptoms are chiefly due to pressure of the bony overgrowth on the nerves. The rigidity in ankylosis is due to the overgrowth of bone. The disease is not so progressive as the atrophic type. It is usually first noticed in the spine or distal phalangeal joints. Treatment consists in the

early fixation of the affected joints. The eliminative functions should be regulated and the general health improved. Where possible hypertrophied bone that interferes with joint motion should be removed.

Infectious arthritis is usually referred to as chronic rheumatism. It is an inflammatory process involving the joints and surrounding

FIG. 4.—Infectious arthritis. Showing early swelling of the phalangeal joints. X-ray of this case shows no bony change.

soft parts, due to germs or their toxins. A single joint may be involved, or a number. The severity of the disease depends upon the character of the infection. The capsule may become thickened, or pus may form, with a resulting destruction of the joint, as is sometimes noted in gonococcal infection. Associated with the joint injuries are often general symptoms indicating a toxemia. In treating this condition the affected joints should have rest, the general nutrition should be conserved, and an effort made to combat the infection. Where pus has formed in the joint it should be drained.

Chronic gout differs from the atrophic or hypertrophic arthropathy as the bone is generally attacked secondarily, and crystals of sodium muriate are deposited in the periarticular structures. In gout the shafts of the bones are slowly absorbed. The process, local at first, later involves the whole bone. The first toe and the thumb are often first attacked. The treatment should be symptomatic.

Studies upon an Experimental Disease Produced by Inoculation with Exoleated Tubercle Bacilli.—

CANTACAZENE. *Annales de l'Institut Pasteur,* t. xix, No. 11, p. 699, Nov. 25, 1905.

Tubercle bacilli killed and completely exoleated are toxic. In sufficient doses they produce rapid death with hyperthermia, acute necrosis of immigrated leucocytes, degeneration of the renal epithelium and of the cardiac fibers, and an acute eosinophilia. In smaller doses they produce a chronic transitory hyperthermia, eosinophilia, more or less transitory emaciation, the formation of tuberculous nodules and abscesses, and enormous enlargement of the kidneys. The tuberculous new formations after having undergone caseation are absorbed without leaving any traces, the absorption taking place in the interior of giant cells. In about three months the animal makes a complete recovery. The inoculated animals react typically to tuberculin for several weeks. The bodies of the exoleated bacilli when treated with Gram's fluid lose their toxicity, and cease to produce any necrosis of the polymorphonuclear cells, or are absorbed a great deal more quickly than bacilli not so treated. Animals that have been once treated with these iodinized bacilli show more resistance against the toxic effects of a second in-

jection of bacilli than those which have not been iodinized. A great increase in the absorption of the exoleated bacilli and of their lesions can be brought about by daily injections of iodide of potassium, which resist to a high degree the phagocytic property of the mononuclear leucocytes.

On the Presence of the Spirochaeta Pallida in the Blood and in the Secondary Lesions of Syphilis.—

BANDI AND SIMONELLI. *Centralblatt f. Bakt., Parasitenkunde u. Inf. Krank.,* vol. xl, No. 1, p. 64, Nov. 24, 1905.

Five cases of untreated secondary syphilis were studied with reference to the spirochaeta pallida. Three were positive, the organisms being found both in the fresh and stained blood. In one case the organisms were found in juice from an enlarged lymph gland. The fresh specimen showed actively motile organisms with snake-like motion, much resembling spirochaeta obermaieri. In form they were very slender, close spirals, with pointed ends. Conglomerate masses of the spirochaeta were observed in smears from a condyloma papule. In one of the three cases the blood was examined by thoroughly disinfecting the skin over an erythematous patch, then puncturing the skin through the patch and applying a capillary glass tube. The blood so obtained was examined fresh and in stained preparations, and the characteristic spirochaetæ were found.

The Intestinal Origin of Pulmonary Anthracosis.—

VANSTEENBERGHE and GRYSEZ. *Annales de l'Institut Pasteur,* tome xix, No. 12, p. 787, Dec. 25, 1905.

It was found that when an animal was subjected to the inhalation of carbonaceous dust, ligation of the esophagus diminished or prevented anthracosis. On the contrary, obstruction of the bronchial tube by means of a plug of cotton introduced through an opening made in the trachea did not prevent the occurrence of anthracosis in that part of the pulmonary tissue which was not in contact with the air. Therefore it seems justifiable to conclude that physiological anthracosis is due, in the great majority of cases, to the absorption of carbonaceous particles from the intestine. These particles, being normally arrested in the nasal fossæ and in the pharynx, are swallowed with the saliva and the nasal mucus, enter the digestive tube, are then taken up by the lymphatics, passed into the general venous circulation, and carried to the lungs, exactly as Calmette and Guérin have shown to be the case for tubercle bacilli ingested by adult animals. If the tracheobronchial lymphatic nodes are healthy, the lungs easily get rid of the foreign bodies. If, on the contrary, the lymphatic apparatus has been previously diseased, or engorged by too frequent inhalations of the dust, definite anthracosis appears. In young animals the carbonaceous particles are arrested in the mesenteric lymphatic nodes, few of them reaching the lungs; but in older animals the lymphatic nodes do not seem to obstruct the passage of the particles on their way to the circulation.

Investigations of Spirochaeta Pallida (Schaudinn in Syphilis.—

BERTARELLI and VOLPINO. *Centralbl. f. Bakt., Parasitenkunde u. Infektionskrankheiten,* Bd. xl, No. 1, p. 56, Nov. 24, 1905.

In forty-two cases of primary and secondary syphilis studied, twenty-six were positive. Of the negative results, six were obtained in cases having had specific treatment for two weeks. In addition, in the liver and spleen of a seven-months' syphilitic fetus spirochaetæ were found in stained sections which showed the characteristics of spirochaeta pallida. They were never found in enlarged glands, or in blood from roseola spots. In diseases other than syphilis, the spirochaetæ found could be differentiated from spirochaeta pallida by their form and easier staining. The sections were never over .005 m. thick, and were stained by

Van Ermengen's silver nitrate method. Spirochaetæ were found single, and at times in great numbers. To preclude the possibility of these appearances being elastic fibers or connective tissue stroma, the authors prepared specimens of liver and spleen from adults, children, and fetuses stained with the same method and with the elastic and connective tissue stain. No appearances were obtained which could be mistaken for the spirochaeta. The authors conclude with the observation that a thorough investigation of the different forms of spirochaeta is necessary to clear up our knowledge of the subject and differentiate the various forms met with in the body.

Landry's Paralysis.—

McGregor, R. *Journal of the American Medical Association,* Dec. 9, 1905.

The writer discusses a case of Landry's paralysis in view of the pathology and etiology of the affection. He believes that it is a toxemia especially affecting the anterior horns of the gray matter of the spinal cord. In the more virulent intoxications the peripheral nerves may also be implicated. These are the cases which give the most trouble in making a diagnosis. The high mortality of this affection is in striking contrast to multiple neuritis and anterior poliomyelitis, with which it is most liable to be confounded. In the case described the attack followed vaccination. It was preceded by chilly sensations, fever, sweating, and vertigo. The rapidly ascending paralysis within the first week involved all four extremities, including speech and deglutition and the ocular muscles. There was cardiac irregularity and dyspnea, but there was no pain or nerve tenderness and no fever after the stage of onset. The patient slept well and took a fair amount of nourishment. At the end of two months the bulbar symptoms improved, but recovery was not approximately complete until two years. The patient has not attained his former weight. There is a slight foot-drop, most marked in the right leg, and the knee-jerks have not returned. In the treatment the best results seem to follow the use of a simple solution of the glycerophosphate of iron with small doses of strychnine.

SURGERY.

Traction in Tuberculous Joints.—

Le Breton, P. *Buffalo Medical Journal,* vol. lix, No. 5, p. 277, December, 1905.

That traction of one kind and another is useful in tuberculous joints is generally accepted. It has been most universally applied in tuberculosis of the hip-joint, though in involvement of other joints it is generally considered useful. Lorenz believes that it is employed for too long a time by most American and many European surgeons. Attention is called to the fact that untreated cases show good results except for the deformity, notwithstanding that they have continued to use the limb. Traction is useful in the relief of pain at the outset, but its prolonged use allows the leg to atrophy. The ligaments about the knee-joint become lax and the disease is not shortened, and the likelihood of deformity appearing later is not eliminated.

In discussing the traction as applied to hip disease, the writer says that the indications should be met in the individual case. The majority of acute cases are quickly relieved by rest and traction, but there are a few which continue to grow worse until an incision in the joint is made. In some cases it is easy to see that fixation has not been sufficient, while in others it has been used too long, and in still others weight-bearing was allowed too soon, which was followed by a relapse. Fixation and traction may be employed while spasm and sensitiveness are present. The patient may be kept in bed for a period of six weeks until the sensitiveness has largely disappeared and the

muscle spasm abated. The patient should then be supplied with a high shoe and crutches and be allowed to get about wearing a plaster spica from the umbilicus down to the calf. If the case is mild a leather spica may be used, which is removed at night, and the traction substituted while the patient is in bed. Later on all cases are supplied with a leather spica strengthened at the groin. This appliance may or may not include the knee. The case is examined at intervals for a return of spasm or acute sensitiveness, and if they are found is remanded to bed and traction. The leather spica while it does not absolutely fix the part prevents deformity, as it keeps the thigh continuously in extension in a straight line without allowing of abduction or adduction to any extent. The spica is removed at first only once or twice a week. Later it is discarded at night. This plan provides traction while there is acute congestion, shown by muscular spasm, tenderness, and night cries. A time will be reached when there is no complaint made on movement of the thigh, and gentle percussion of the heel, knee, and trochanter do not cause pain. Then fixation and protection from jar are the major indications. The ultimate aim in most cases is to secure ankylosis in a good position.

A New Method of Surgical Anesthesia.—

BABCOCK, W. W. *Proceedings of the Philadelphia County Medical Society,* vol. xxvi, No. 9, p. 347, Nov. 29, 1905.

The writer has added considerable to our knowledge of the method of anesthesia by the use of drugs. The popular belief that surgical anesthesia dates from 1846 is erroneous. In the early part of the nineteenth century full doses of morphine were given combined with tartar emetic; in this way not only was sensibility blunted, but shock and severe reaction prevented. In the seventeenth century it was current knowledge that ancient surgeons had produced anesthesia in patients upon whom they operated, although the method seems to have passed out of practice. The best known of ancient drugs was the mandrake. This contains a number of active alkaloids, including scopolamine. Mandragora was esteemed by ancients as a pain-destroying remedy. A celebrated Chinese physician, Hoa-Thoa, who lived during the early part of the third century, gave to patients a preparation of hemp which made them insensible. In this way openings and incisions were made and amputations performed without pain. These references show that the scopolamine-morphine anesthesia of Schneiderlin is a return to ancient methods.

There is no definite lethal dose for scopolamine. Recovery has followed the ingestion of one-quarter of a grain. It is probable that the deaths reported in scopolamine-morphine anesthesia are often attributable to other conditions, as in many cases the operation was undertaken in patients who would not be expected to survive ordinary inhalation anesthesia. A considerable proportion of patients who are given the scopolamine-morphine have to have an inhalation of ether or chloroform in addition. The writer has endeavored to improve the method of anesthesia by injection, using for this purpose in addition to the injection one-tenth grain of apomorphine. In 40 cases scopolamine or related alkaloids were given for purposes of surgical anesthesia. In 35 cases no anesthetic was given by inhalation, while in five ether was administered. In injection anesthesia by Schneiderlin's method, the first injection is given four hours before the operation. This in the writer's judgment is too long a time, as the scopolamine may be nearly eliminated in that time.

In the technique advocated by the writer the patient is prepared in the usual way. Sixty minutes before the time of operation the patient receives a hypodermic injection of scopolamine hydrobromide 1/100 of a grain and

morphine hydrochlorate 1/6 grain. This is usually followed by a sleepy feeling, but consciousness is retained. An enema is now slowly run into the bowel by gravity from an elevation not greater than two feet above the bed, consisting of spiritus etheris compositus one-half ounce, spiritus frumenti one-half ounce, warm water to make four ounces. Fifteen minutes after the first a second hypodermic is given of scopolamine hydrobromide 1/100 grain and morphine hydrochlorate 1/6 grain. Following this the patient's drowsiness increases, and there is some reduction in sensibility, but the patient remains conscious. Fifteen minutes after the second hypodermic the patient may be moved to the operating-room, and in most cases complete unconsciousness with anesthesia can be induced in from three to ten minutes by a hypodermic of apomorphine hydrochlorate 1/30 to 1/10 grain and scopolamine hydrobromide 1/100 grain. There may be slight nausea or emesis following this injection, after which the patient becomes unconscious. If the operation is a prolonged one, or if anesthesia is not quite complete, a fourth hypodermic may be given composed of morphine hydrochlorate 1/30 grain and scopolamine hydrobromide 1/100 grain. The apomorphine is to be used sparingly when the pulse is weak. The advantage claimed for the scopolamine-morphine anesthesia is that its dangers recede as the operation progresses. In prolonged operations the pulse and general condition are better at the finish than at the beginning. It is the best method of anesthesia in operations involving the upper respiratory tract. During the anesthesia the respiration is quiet, skin is dry, and there is a continuous analgesia for many hours after the operation. There is an absence of malaise, which so often succeeds the inhalation anesthesia. The danger is probably more in the morphine than in the scopolamine. It is probable that the danger of ether or chloroform inhalation is increased by the previous use of these narcotics. The time for the production of the narcosis should be as brief as is consistent with safe dosage, as the duration of the scopolamine effect in many patients does not exceed two or three hours. Apomorphine is a powerful adjuvant, increasing the relaxation and the depth of the narcosis. Further investigations are needed, and greater accuracy in the isolation and standardization of the drugs used is much to be desired.

The Muscle-splitting or McBurney Incision in Acute Appendicitis With or Without Abscess.— CRANDON, L. R. G., and SCANNELL, D. D. *Boston Medical and Surgical Journal,* vol. cliii, No. 26, Dec. 28, 1905.

The course and results in seventy-five consecutive cases are reported. It is contended that the muscle-splitting incision is the best for cases of acute appendicitis with or without abscess. This incision, which is made about three-quarters of the distance from the navel to the anterior superior spine, is nearly transverse, bisecting the angle made by the external and internal oblique muscles as they cross each other. After the fibers of the external oblique aponeurosis are recognized a nick is made with a knife between two fibers, and this is enlarged by tearing either with a knife handle or with the fingers. Then the muscle fibers of the internal oblique are similarly separated. After good retraction the peritoneum is lifted between two forceps and opened. In closing the wound two or three continuous catgut sutures close the external oblique. The subcutaneous fat is then sutured and the skin closed by silkworm-gut or horsehair stitch.

The rectus incision, which goes through the skin and anterior sheath of the right rectus and then the muscular belly, and is retracted toward the median line, has certain advantages. It admits of indefinite enlargement up

or down, and is far less destructive than the original oblique incision, which goes through everything. The disadvantage of the rectus incision is that the muscle varies in width, so that incisions which are intended to be over the belly of the muscle may come down directly on the linea semilunaris. This makes the incision directly through the abdominal wall with no protection against protrusion. In this incision there is some chance of wounding the deep epigastric vessels. This incision frequently opens into the abdominal cavity apart from the walled-off abscess, and is internal to the mesentery which shuts off the right iliac fossa. In case it should be necessary to drain, the pus will have to be taken across an uninfected portion of the abdomen. In the Boston City Hospital since 1880 there have been twenty-two hernias which have come back for operation. Of these seventeen occurred after the old-fashioned direct oblique incision; five after the right rectus incision; while with the muscle-splitting incision there were none.

The muscle-splitting incision requires more delicacy of dissection and it cannot be made so quickly, and more dexterity is required in maintaining drainage. Its advantages are that in most cases it opens directly over the seat of the disease. It is worth the care necessary to make it properly, as even after prolonged drainage there is an assurance that there will be no hernia. From the moment the patient leaves the operating table every movement involving contraction of the abdominal muscles tends to bring together the separated muscular fibers. Because of this tendency to come together stitches are of little advantage, and the surgeon is much tempted to omit the safeguard of temporary drainage in doubtful cases. The muscle-splitting or McBurney incision is desirable in all cases of appendicitis unless an abscess is obviously pointing in a remote or unusual situation.

Air in the Circulation.—

LARNED, E. R. *Surgery, Gynecology and Obstetrics,* vol. i, No. 6, p. 533, December, 1905.

The writer, in an experimental study on the subject of air embolism, comes to the conclusion that Senn's statements as to air embolism are in the main correct. A small amount of air in the right side of the heart in a healthy animal causes only temporary symptoms referable to the heart's action on the pulmonary circulation. When air has been injected into the right side of the heart in such quantities as not to arrest the contractions of the heart itself, it is forced through the pulmonary capillaries into the left side of the heart by the contractions of the right ventricle. The danger attending the insufflation of air in the veins is proportionate to the amount introduced as well as the capacity of the right ventricle to resist intracardiac pressure. When a fatal dose of air has been introduced into the circulation, death takes place almost instantaneously from arrest of the heart's action, or later from suffocation. Spontaneous ingress of air into a wounded healthy jugular vein never occurs in experiments, and must be considered almost a physical impossibility, as the resilient walls of the wounded vein readily collapse when exposed to atmospheric pressure.

Nephroptosis and Nephropexy.—

STURMDORF, A. *Medical Record,* vol. lxix, No. 2, p. 45, Jan. 13, 1906.

The vices of skeletal conformation play an important part in the production of nephroptosis. A normal support of the kidney presupposes a retaining pressure of adequate intensity and a receptacle of accurate conformation. The retaining pressure is exerted by the normal tension of the general peritoneal sac applied to the anterior kidney surface. It acts like an inflated cushion. This pressure is regulated by the activity of the abdominal muscles.

The receptacles are formed by the declivity existing on each side of the anterior aspect of the lower dorsal and upper lumbar spine. They are funnel-shaped recesses, narrow below in the male, more cylindrical and shallow in women, a peculiarity more marked on the right side, and appearing with the broadening of the pelvis at the advent of puberty. Deviations in the conformation of these receptacles constitute the main predisposing factor in the production of nephroptosis. The causes of such deviations are embraced in the category of congenital and acquired skeletal abnormalities. The treatment in many cases should begin with the developmental period of the osseous framework. The restoration of normal internal as well as normal external conformations should be the aim. Much can be accomplished in the correction of external or skeletal abnormalities, and much can be accomplished by attention to the visceral displacements induced by such abnormalities. Kidney dislocation once developed requires surgical fixation to establish normal stability. Palliative treatment yields only temporary results.

Obstruction of the Pylorus.—

HALSEY, R. H. *Medical Record,* vol. lxix, No. 2, p. 53, Jan. 13, 1906.

The writer reports six operations for pyloric obstruction, five of which were gastroenterostomies. Four were for benign and three for malignant disease. Attention is called to the fact that in non-malignant conditions there is usually a history of digestive disturbance extending over several years. The history of a few months of digestive disturbance points rather to malignant disease. A stomach distended with food and inactive peristalsis has an obstruction at the outlet whether a tumor can be felt or not. The presence of lactic acid and the Oppler-Boas bacillus must not be interpreted to indicate cancer, nor does the finding of free hydrochloric acid and sarcinæ indicate malignant disease. Retention of food in the stomach can cause the suppression of the secretion of hydrochloric acid and will lead to the formation of lactic acid.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

The Medical Treatment of Uterine Fibroids and Its Limitations.—

WILSON, T. *Lancet,* vol. clxix, No. 27 of vol. ii, p. 1886, Dec. 30, 1905.

In discussing uterine fibroids attention was called to the fact that the tendency toward impaired health or a fatal issue is not the same in this disease as it is in ovarian cysts and many other affections for which the aid of surgery is invoked. Small uterine fibroids are very common and exist in the proportion of 20 per cent of all women over the age of 35. The majority of course are symptomless and vary in size from that of a pea to that of a walnut. The proportion of women in whom fibroids cause symptoms is very much less. In the writer's 8000 cases of disease of the generative organs in women, 274 cases were found to be fibroids, or 3.5 per cent. The frequency equaled that of uterine cancer in the same series. Comparing the clinical rate with the pathologic frequency it appears that the majority of uterine fibroids give rise to no symptoms, or those which are so slight or transient as not to lead to the recognition of the disease. In a certain proportion of cases serious symptoms are caused which call for surgical interference. Certain troubles follow such operations, and they should not be undertaken unless the life or continued good health of the patient is threatened. It is obvious that if every case diagnosed were operated upon the statistical results would nowadays be excellent, but brilliant operating is not necessarily good treatment. Of the writer's 274 cases 26 were polypi. Leaving these out of consideration there remain 248 cases of fibroids, among

which 74 were treated by radical operations and chiefly by abdominal hysterectomy. In 29 of these cases operation was made for a tumor already of considerable size or rapidly growing, or associated with some severe symptoms such as pain or menorrhagia; in 14 the indication was excessive or persistent uterine hemorrhage; in 13 the chief symptoms were severe or incapacitating pain. In six there had been pelvic incarceration of the tumor leading to retention of urine. The remaining cases included two operations undertaken for ovarian cyst, one for tubal gestation, one for obstructed labor, and one for a sloughing submucous tumor. In 69 tumors there were complications either affecting the tumor itself or other organs. Of the 248 cases radical operation was clearly indicated in 30 per cent.

When a uterine fibroid gives rise to symptoms that lead to its detection there is a possibility that these symptoms may become dangerous to the health or even to the life of the patient. It is impossible to forecast the course and termination of the affection. Occasionally the tumor increases rapidly for a time, or it remains stationary or becomes somewhat smaller. The line of growth is variable. A small tumor may cause excessive pain and hemorrhage, while a large one may give rise to none of these symptoms. A period of excessive hemorrhage may occasionally be followed by one of regular and moderate menstruation. A uterus affected with fibroids often undergoes changes at the catamenial periods. In the days preceding menstruation the organ may increase in size to a considerable extent. During and after the period diminution takes place, and the uterus remains small until the next menstrual congestion occurs.

Fibroids are most common between 35 and 50 years of age, and the opinion that they become innocuous or disappear at the menopause is a popular fallacy. In some instances they may become surrounded by fibrous tissue and undergo degenerative changes, but there is no proof that they ever disappear. In a large number of cases the symptoms continue long after the age at which the menopause usually occurs. Marriage and sterility have no definite influence on the incidence of uterine fibroids, and their presence does not markedly influence conception nor does it interrupt the course of pregnancy. In the latter condition the fibroids increase with the growth of the uterus, and undergo involution when pregnancy is at an end. While many fibroids atrophy or become quiescent, in many cases they lead directly or indirectly to the death of the patient. A woman with a large fibroid is not likely to live to old age. The relation of fibroids to malignant disease is far from clear. It is impossible to foretell in any individual case what the result will be or to estimate the result of treatment.

Medical treatment may be of value in cases in which the diagnosis is made and there is nothing that calls for immediate surgical interference. A number of drugs have been recommended, such as calcium chloride and iodide of potassium. Ergot and its derivatives given by the mouth or subcutaneously have been claimed to cure 20 per cent of the cases. The hypodermic method has been employed most largely and is most efficient, but it is tedious and may be followed by abscess. Electrolysis of the tumor by passing a needle into it through the abdominal wall or cervix was tried by Cutter. Of fifty patients four died as a result of the treatment, so that the mortality was distinctly higher than that of hysterectomy. The Apostoli method was at one time very popular, but it is an expensive and tedious treatment; its effects are valuable in diminishing hemorrhage and improving the general health. But these results may be attained by other and less troublesome means. If the tumor is increasing in size but the symptoms are not urgent, ergot should be administered in half-drachm to

drachm doses of the liquid extract three times a day. This should be associated or alternated with extract of hydrastis in similar doses. While little can be hoped for from medical treatment itself in the direct cure of the disorder, it is possible to alleviate the symptoms and in this way postpone operation and frequently obviate it. Rest, ergot, and the application of iodine to the endometrium is the best method of meeting the menorrhagia. Hot douches are also useful. They should be copious and should have a mild antiseptic added to them. In a small percentage of cases in which bleeding is the only symptom curetting of the endometrium and cervical dilatation may be of service. It is only applicable in those cases in which the uterine cavity is not much deformed and contains no prominent tumors that are likely to have their vitality impaired or destroyed. The application of Churchill's tincture of iodine to the endometrium, if carefully done, where the internal os admits of proper drainage, may be useful. Iodine is better than other caustics as it is a reliable antiseptic and a good hemostatic. It causes only a thin superficial necrosis of the endometrium. The application can be repeated once a week in the intervals between the periodical losses. Pain may call for the administration of sedatives, but these must be given with caution as the trouble is chronic and may lead to the formation of a habit when opium or alcohol is relied upon.

The "Fourth Disease" and "Fifth Disease."—

KOHN, B. *American Medicine*, vol. xi, No. 2, p. 72, Jan. 13, 1906.

The writer in discussing these new additions to the exanthemata says there has been a successive differentiation of the various forms since the middle ages. Scarlet fever was confounded with smallpox as late as the eighteenth century, while rubella is a comparatively modern acquisition. The term rubella has been suspected to cover two and perhaps three diseases. In 1900 Dukes pronounced in favor of a fourth disease. This idea was not extensively adopted in this country, though it received the support of some of the leading pediatrists in England and on the continent. Cheinisse and Unruh call attention to the numerous cases which cannot be brought under the head of either scarlatina, measles, or rubella. The fact that these anomalous cases occur in epidemics and that an attack does not confer immunity to the other diseases, and that it occurs in those who have had the other exanthemata, leads them to the conclusion that it is a separate disease. The description of Dukes and later writers would place the period of incubation at about two weeks. In most cases there are no prodromes. The rash consists of a closely punctated, slightly raised, erythematous eruption, the color of which resembles that of scarlet fever. It appears first on the face, and in a few hours spreads over the body. In twenty-four or thirty-six hours the rash fades, followed by a slight desquamation. There is usually some injection of the pharynx and conjunctiva, but Koplik's signs and the strawberry tongue are never observed. Moderate fever of short duration is invariable. This symptom-complex differs from the typical descriptions of rubella in too many points to be regarded as a mere variety of that disease. This is especially true in view of the fact that the other exanthematous diseases always present a more or less uniform picture. If Dukes's disease is finally accepted as a separate entity it will probably include those cases which were formerly classified as a scarlatinous form of rubella, which latter disease will then embrace all the morbillous forms.

Another candidate known as the "fifth disease" has advanced claims for recognition. It like the other has been included in the rubella

group. The eruption usually occurs without prodromes and appears first upon the face, especially on the cheeks. The skin becomes the seat of a rose-red efflorescence which is hot to the touch and is raised above the surrounding surface. There are no subjective sensations of heat, pain, or itching. The eruption is usually confluent upon the cheeks, is sharply demarcated by an irregular border, and usually spares the nose, lips, and chin. The appearance is very like erysipelas. The fundamental elements of the eruption are maculopapules. In twenty-four to forty-eight hours it begins to fade from the center toward the periphery, and at the same time an analogous eruption appears on the extremities. Here the rash is more apt to form in patches of varying size. The extensor surfaces are especially affected, and the eruption progresses from the proximal to the distal end of each extremity. As the patches fade in the center the skin may assume a marble appearance. The eruption generally spares the tongue. The mucous membranes are never affected, and the scarlatinal tongue never develops. The lymphatics are not enlarged and there is seldom any fever.

Kohn says that there is yet hardly sufficient data to formulate a definite opinion, but the fact that many leading pediatrists have accepted a "fifth disease" should give it a certain standing. The difference between the latter affection and Dukes's disease is quite as marked as the difference between the latter and rubella.

Glandular Fever.—

VIPOND, A. E. *Archives of Pediatrics*, vol. xxiii, No. 1, p. 11, January, 1906.

The writer makes a plea for a more prominent position of this disease and reports twelve cases. It is characterized by an inflammation of the lymph nodes of the anterior and posterior triangles of the neck, sometimes involving the glands of the axilla and inguinal region. Since it was first described in 1889 many cases have been reported. Glandular fever is rarely seen after the sixteenth year. It has been met with as early as seven months, but children between four and twelve years are most frequently attacked. It frequently affects more than one child in the family. Both sexes are about equally subject to the disease. The period of incubation is from five to seven days. The onset is sudden, with headache, pains in the limbs, vomiting, pain in the abdomen, chills, and loss of appetite. The tongue is coated, the face flushed, and the bowels constipated, though occasionally there may be diarrhea. The temperature runs from 102° to 104° F., and the pulse from 110 to 130. In twenty-four to forty-eight hours there is stiffness and pain in the neck, aggravated by movement.

On examination the lymph nodes are found enlarged. As a rule the mucous membrane of the throat is quite free, with the possible exception of some redness of the tonsils. The nodes first affected are at the posterior border of the sternomastoid. They are tender, hard, and freely movable, about the size of a bean. Next in order of involvement are the nodes at the angle of the jaw, and then those at the anterior border of the sternomastoid. As a rule the left side of the neck is first involved. Movement of the head causes pain, but there is no pain on swallowing, though there is a sensation of tightness in the throat. The evening temperature remains high for three to seven days, with morning remissions, the fever frequently ending by crisis. The fall in temperature is accompanied by lessening of the pain, and the swollen glands begin to subside. Resolution commonly takes place in from fourteen to twenty-one days, though convalescence occurs soon after the temperature falls. Suppuration is a rare event and probably does not occur in typical glandular fever.

The above description applies to the ordinary severe attack, but many cases will present less

acute symptoms, the onset not so abrupt, and the evening temperature often not reaching above 101°, the disease only lasting two or three days. Ninety-six cases have been reported by West, and of these only one died. Siebert reported twenty-four cases with one death. None of the writer's twelve cases developed grave symptoms.

Pathology and Bacteriology of Serous and Purulent Pleural Effusions in Children.—

EMANUEL, J. G. *Lancet,* vol. clxx, No. 2 of vol. i, p. 85, Jan. 13, 1906.

Purulent effusions are far more common before the tenth year than they are afterward. Under three years of age it is almost certain that the accumulated fluid is purulent. About 75 per cent of empyemata in children are due to the pneumococcus. They may be divided into two groups—those associated with pneumonia and those which are primary; 17.6 per cent of the empyemata of children are caused by the streptococcus. This infection may occur alone or be associated with the pneumococcus or the tubercle bacillus. The streptococcus is not infrequently found in empyemata secondary to suppurations in other parts of the body. About 25 per cent of the empyemata in adults and children are due to the tubercle bacillus. It is rare to find the bacillus in purulent effusions. The virulence of these different infecting agents varies very much. From the standpoint of bacterial involvement there is no difference between purulent and serous effusions. Both varieties may be produced by the same infecting agent. Netter's observations show that many cases which are supposed to be due to traumatisms or cold were often found tuberculous, and those in which there was a simple serous effusion were found in a considerable proportion to be tuberculous. He concludes that 40 per cent of all primary exudates are tuberculous, and that in serofibrinous pleurisy the tubercle bacillus is the most common agent.

Acute Yellow Atrophy of the Liver Following Eclampsia.—

ROYSTER, L. J., and GRANDY, C. R. *Medical Record,* vol. lxix, No. 1, p. 8, Jan. 6, 1906.

The case of a young woman is described who had her first convulsion during labor and died two days later. For some time before death she was jaundiced, and the autopsy corroborated the diagnosis of acute yellow atrophy of the liver. The writers believe that acute yellow atrophy of the liver and eclampsia are closely related. The primary condition in both is a toxemia. It may only be severe enough to produce headache, lassitude, disturbances of vision, and a diminished excretion of urine and urea, with possible edema and albuminuria. In some cases this stage is followed by coma and death without convulsions, the pathological findings being the same as in eclampsia. In the second stage of eclampsia the toxemia is severe enough to interfere with the functions of the liver and kidneys and to produce nervous irritation, evidenced by the convulsions and coma. The severer poisoning produces grave lesions in various organs and often causes death; in acute atrophy of the liver the changes have progressed, practically destroying the organ. In these cases there are added to the convulsions, which do not necessarily occur, a deepening coma, an increasing jaundice, vomiting, and often purging, the cases practically always terminating fatally.

The Principles which Underlie the Milk Feeding of Infants.—

SOUTHWORTH, T. S. *Medical Record,* vol. lxix, No. 2, p. 50, Jan. 13, 1906.

The scientific principles underlying the milk feeding of infants are based upon a study of how milk which remains practically the same throughout lactation can be equally suitable for the digestion at birth and that which occurs at the time of weaning. The explanation is that the milk itself is directly instrumental in developing the digestive tract through the changes

in consistency of the curd caused by the alterations in the composition of the developing gastric juice. The infant's first semisolid food is produced by the action of rennet alone. Then hydrochloric acid and pepsin are secreted in larger amounts, the acid causing the curds to become more solid, while the pepsin is provided to digest them. In this way the amount of work for the stomach keeps pace with the gastric digestion. Cow's milk is the best for substitute infant feeding. But the measures adopted to secure the digestion by the infant of a sufficient amount of casein in cow's milk will have to be decided by the physician for each individual infant. This is the art of infant feeding as distinguished from the science of infant feeding. It is for the physician to determine whether he will make such addition to the milk that it will remain in a semifluid state, or by the free use of some alkali will throw the digestion of the food in the intestine, or by the use of a gruel diluent will mechanically separate the milk curds. One of these methods may be used or several may be combined, or milk may be withdrawn altogether and something temporarily used which will not form a solid in the stomach.

FORENSIC MEDICINE.

Presumption as to Sanity and Suicide.—

Journal of the American Medical Association, vol. xlvi, No. 2, p. 155, Jan. 13, 1906.

The Court of Appeals of Kentucky (Masonic Life Association *vs.* Pollard's guardian) holds that the law presumes every man to be sane until the contrary is shown. Likewise the law indulges a presumption against suicide as being unnatural. Presumptions of this nature are indulged in the absence of proof. If the evidence shows that suicide was committed while the person was in possession of his faculties no such presumption applies. Where the dead body is discovered in the presence of the implement of death and the surroundings are such as to admit of the conclusion either that it was self-inflicted or it was intentionally done, then the presumption does not apply. Where there are eye-witnesses to the occurrence whose testimony tends to establish that the act was intentional and that the person was in a normal condition, and that the motive probably influencing the action was fear of disgrace, then it would be improper to say that the act was presumed in law to be unintentional or the result of insanity. In reference to sanity or insanity at the time of suicide the court says if it can be shown that at the time life was taken the person's mind was so far gone as to render him unconscious that he was taking his life, the act will not be deemed his but will be regarded in law as an accidental killing. The converse is equally true—the mind may have been deranged, still if he had mind enough to know that the act would probably result in his death, and if he inflicts it with that intention, it is his act in law.

[The latter portion of the decision shows how persistently metaphysical distinctions are maintained by courts. While the ablest jurists are receding from the doctrine that a knowledge of right and wrong is the proper test for irresponsibility, we have in this decision the same tests set up in relation to suicide. If the nature and consequence of the act are known to the person even if he be deranged and he designs to perform the act, then he is regarded as responsible. Under a rigid application of such a rule there would practically be no insane suicides. The demented and those in whom consciousness is impaired, as in epilepsy, almost never commit suicide. They are about the only ones who are so far bereft of mental capacity as to be incapable of forming the intention or of

knowing that it would result in death. It will be seen how tenaciously courts cling to the belief that in some way a rule of law must guard the interests of the people where the question of mental disease is concerned. Alienation is, like any other fact, subject to proof. The question is one for the jury to decide from all the evidence whether in their judgment the act was the result of mental disease. Such a simple rule clears away all the rubbish surrounding the question of suicide as a defense for crime.]

Post-mortem Examinations which Do Not Reveal the Cause of Death.—

SMITH, F. J. *British Medical Journal*, No. 2346, p. 1584, Dec. 16, 1905.

It is a common belief in the laity and not rare in the medical profession that all that is necessary to ascertain the cause of death is to make a post-mortem examination. In 2123 post-mortem examinations performed carefully and recorded with exactness at the London Hospital, no less than 102 presented no naked-eye changes to which death could be attributed. In the period covered by the report there were 115 cases of death ascribed to wasting without obvious clinical cause and diarrhea and vomiting. Of these no fewer than 83 showed nothing in any of the internal organs to which death could be ascribed. In all these cases it would have been impossible for autopsy alone to explain the death. Where there is extensive injury and laceration of the tissues with severe hemorrhage the cause of death may be stated, but where disease is found in the heart, lungs, stomach, or kidneys without clinical history the most that the pathologist can say is: "I found gross disease of such and such organ, and it would be sufficient to account for death sooner or later and may have caused it now." In concluding the writer says that a verdict arrived at based on the pathological evidence alone is often valueless. It is absolutely essential in arriving at a correct conclusion that the clinical history should be coördinated with the pathological findings. The latter are important and valuable, but the two should be associated in order to arrive at a correct conclusion.

Walking Before Jury to Illustrate Injury.—

Journal of the American Medical Association, vol. xlvi, No. 2, p. 154, Jan. 13, 1906.

The Supreme Court of Alabama (Birmingham Railway Light and Power Company *vs.* Rutledge) makes some pertinent remarks relative to exhibitions before the jury. The court says that it does not know what figure the plaintiff cut when told by his counsel and allowed by the trial court against the defendant's objection "to walk the best he could before the jury." The results of that experiment could not intelligibly be placed upon paper, so the court is not advised whether he did "his best" in the way of walking, or did his best in the way of impressing the jury that his powers of locomotion had been greatly impaired. Certainly it was a temptation toward the latter course, and it would seem impracticable by any sort of "cross exercise" to test the good faith of the gait. Ethically speaking there was grave doubt whether this man's physical organism should have been exposed to this temptation, and to the strain necessary to yielding to it if he did yield. The evidence was on the same plane as that afforded the jury by a view of his person in repose, or by having him to stand before them to show that one leg was longer than the other, or by exposing an arm to the jury on invocation to do his best in bending it, the claim being that there was stiffening and therefore he was incapable of normal use of the arm. The court is not prepared to say that the lower court erred in allowing this walking illustration of the plaintiff's alleged injury.

Poisoning by Nitrobenzol.—

VIZARD, A. H. H. *Lancet,* vol. clxx, No. 2 of vol. i, p. 88, Jan. 13, 1906.

Cases of poisoning by nitrobenzol or nitrobenzene, artificial oil of bitter almonds, essence of mirbane, are rare. A fatal case of poisoning occurred in an engineer who took the substance by mistake. It was not until four or five hours afterward that he became unconscious. Nearly five hours elapsed from the time of the taking of the nitrobenzol until the patient became seriously ill, but during the latter two hours of that period he is said to have felt badly. There were three attacks of collapse, which quickly followed each other. This retardation of the symptoms of poisoning with this substance is mentioned in the text-books. Another feature was the extreme lividity of the face and the purple color of the lips. The pupils were widely dilated, but became smaller shortly before death. No convulsions occurred, and death took place suddenly from cardiac failure. Almost up to the time of the patient's death he was able to answer questions.

Remarkable Evidence in a Personal Injury Suit.—

Lancet, vol. clxix, No. 27 of vol. ii, p. 1912, Dec. 30, 1905.

The case of May *vs.* the Taff Vale Railway Company involved some interesting and striking testimony tending to show self-inflicted injury. The case was tried twice; in the first instance the jury disagreed. The action was brought by a man 37 years of age for the loss of both feet. The plaintiff testified that he was riding in an empty second-class carriage, and that the train jerked, and as he fell against the door it opened, and he was thrown on the line, falling against a stationary coal wagon. An approaching train came upon him and cut off his feet. It was claimed by the defendant company that May deliberately submitted himself to mutilation to obtain insurance and to get compensation from the railway. The points relied upon by the defendants were that May had no trace of injury upon him excepting a slight scratch on the brows, and that this was inconsistent with his having fallen from a train going 28 miles an hour. His clothes also presented nothing that would indicate that he had sustained a fall. The line where the accident occurred is perfectly straight, and no one else on the train noticed a jerk. It was further shown that the plaintiff had said that he dreamed that he was going to have both legs cut off above the knee, and that on leaving the house before the accident he remarked to his landlady, "I am going to have my legs cut off here. I wonder how it will turn out." Also that he had taken three pocket-handkerchiefs with him. It was further claimed that it was unlikely that a door of a railroad carriage would close again of its own accord.

Carbon Monoxide Poisoning.—

INGRAM, P. C. P. *Lancet,* vol. clxix, No. 27 of vol. ii, p. 1894, Dec. 30, 1905.

A case of carbon monoxide poisoning is described which occurred as a result of incomplete combustion in a burning building. The victim of the accident was found seated at a table, where he had evidently been overcome when asleep. At the time he was found the body was still warm, but rigor mortis had commenced. The body was covered with soot, but was not scorched. The post-mortem examination was made two days later. Bright pink post-mortem stains were visible on the back and under surface of the legs and arms. In these dilated superficial vessels were seen. The lips were pale, the eyes half-closed; the pupils were of normal size, and the conjunctivæ were slightly injected. The veins of the pericranium and cerebral cortex were dilated, the blood having the characteristic pink color. The respiratory tract from the pharynx to the

bronchi were filled with a mixture of soot and mucus. The lungs were full of bright-red blood. A diluted specimen of the blood gave the characteristic pink tinge described by Haldaine, and with a spectroscope the permanent absorption bands were easily made out. The condition of combustion was such that carbon monoxide was probably produced in large quantity. The fire scarcely reached the room in which the deceased was found.

PUBLIC HEALTH.

The Adulteration of Silk with Tin.—

Lancet, No. 1, p. 49, Jan. 6, 1906.

As long ago as 1899 the *Lancet* called attention to the amount of foreign matter contained in dress materials. Many of these substances are ordinarily insoluble, but when in contact with perspiration a certain amount would go into solution which might prove very irritating to the skin. Only small traces of arsenic were discovered, but zinc, aluminum, chromium, tin, magnesium, and iron were found. The quantity varied from one-tenth of an ounce to six ounces in cloth sufficient to make a dress. The *Lancet* has recently undertaken an analysis of the silk found on the market. In one case as much as 36 per cent of the silk was composed of a salt of tin. Of six samples examined none were found free from tin, though in one sample the amount of stannic oxide was slightly below 20 per cent. The percentage of real silk present in the highest sample was only 60.

A very interesting account is given of the method by which silks are "loaded." The silk fiber is principally composed of sericin. This substance has a slightly acid reaction, and it combines with metallic oxide and basic dyes. Advantage is taken of this fact to weight cheap silks to an enormous extent. The silk is soaked for several hours in a solution of stannic chloride, after which the fabric is passed through a cold solution of carbonate of soda to set free the tin in a basic condition so that it can combine with sericin. A bath in neutral soap solution makes the fiber supple and increases its affinity for more weighting material, when the fabric is ready for another turn in the tin bath. Three passages through this process will increase the weight of the silk 25 per cent. Ten passages would increase it 160 per cent. Although the strength of the fiber is reduced the appearance and luster do not seem to be affected for the time being. All goes well so long as the fabric is kept in the dark, but as soon as it is worn the light decomposes the compound, producing oxide of tin and free acids, which rapidly destroy what is left of the fiber. The contact of the oxide of tin with the skin may give rise to irritation.

Colliery and Mill Explosions.—

Knott, J. *St. Louis Medical Review,* vol. liii, No. 1, p. 1, Jan. 6, 1906.

Extensive explosions in mines are due to coal dust rather than the so-called fire-damp. For a period of nearly thirty years no extensive colliery explosion has taken place in a damp or wet mine. The explosions which take place in dry and dusty mines pass through all the workings with the exception of those parts containing no dry coal dust. Fire-damp may occur in wet mines, but in order to form an explosive mixture it must be present in more than six and one-half per cent, otherwise it cannot be ignited. Fire-damp may accumulate in such proportions in wet mines, but they are in limited sections of the workings, and at most the explosion may burn or injure one or two men, but no great explosion can occur without the presence of coal dust. Twenty-five years ago the relation of dust to explosions was understood, but it is only recently that its practical importance has been appreciated. Air

containing less than one per cent of fire-damp becomes inflammable when coal dust is added. In all dry coal mines the floors are covered with fine coal dust, which is also deposited on timbers and on the rough side of the roadways by air currents. If a local explosion of fire-damp takes place, or if a blasting shot is fired at a point where a gust of wind and the flame which accompanies it can raise and ignite a cloud of dust, the force of the disturbance increases continuously and automatically. Impelled from behind by the rapid expansion of the highly heated air which has spent its oxygen for the combustion of the dust, the air in front of the flames sweeps up and mixes with the dust over which it passes, and in its turn becomes the vehicle for the continuance of the flame. The true remedy is to convert deep and dusty mines, by a system of sprinkling, into artificially damp ones. The relation of dust to mill explosions has been known for some time, but it remained for Galloway to demonstrate experimentally the explosive quality of dust. The only conditions necessary for a dust explosion are that the particles must crowd the atmosphere to the extent that one cannot burn without igniting its immediate neighbors.

Mosquito Work on the Isthmus.—

GORGAS, W. C. *Journal of the American Medical Association*, vol. xlvi, No. 5, p. 322, Feb. 3, 1906.

The principal mortality on the isthmus during the French occupation was from malaria and yellow fever. The mortality was enormous, and it is probable that not more than half of the deaths were recorded. At that time there was no policing of the canal zone. It is useless to criticize the methods in vogue at that time, as the knowledge of the method of transmission of malaria and yellow fever was then unknown. At present there is no fear of contracting the disease from other cases, as each patient is carefully protected by a wire screen just large enough to cover the bed. In addition every means is taken to keep mosquitoes out of the hospital wards. Every two weeks the wards are fumigated with sulphur. This is sufficient, as the incubation period of the mosquito is such that it catches all of them before they can do harm. If patients elect to be treated at home similar methods are employed. The room is screened and guarded and the rest of the house fumigated; at the termination of the case the house is again fumigated. The campaign against the breeding-places of the stegomyia has been efficient, so that 90 per cent of their breeding-places have been destroyed in the city of Panama between the periods of March and October of last year. The destruction of the stegomyia in Panama has been a far more difficult problem than it was in Havana. In Panama 90 per cent of the mosquitoes belong to this species, while in Havana only five per cent of the mosquitoes belong to the stegomyia. The greatest difficulty on the isthmus has been in dealing with malaria. Here the principal reliance has been placed on superficial ditching. In October last there were only 21 per thousand on the sick list out of 22,000 employees. Gorgas is of the opinion that the health conditions are quite as favorable on the isthmus as they would be in similar work in Maryland or Pennsylvania.

A Contribution to the Method of Hookworm Infection.—

STILES, C. W., and GOLDBERGER, J. *American Medicine*, vol. xi, No. 2, p. 63, Jan. 13, 1906.

The writers recently obtained some feces containing the eggs of the hookworm. They were present in considerable numbers. The eggs were allowed to incubate, and while in the infective stage were brought in contact with the skin of rabbits and dogs, care being taken to avoid infection by the mouth. In all four cases the young hookworms were found

in the small intestine, and in one dog in the stomach also. The various stages through which the parasite passed are given. The writers have had no further opportunity to study the infection in animals, but this experimental work proves conclusively what has heretofore amounted to almost a demonstration, that the hookworm can readily penetrate the skin, and it is in this way that the infection occurs in countries in which the natives largely go barefoot. While both rabbits and dogs may be affected in the young stage of the parasite, there is no evidence that these animals play a rôle in the spread of the disease in man. There is no evidence that the worms reach maturity and reproduce in either the rabbit or the dog.

Clean Air.—

PRUDDEN, T. M. *Medical Record,* vol. lxix, No. 5, p. 165, Feb. 3, 1906.

Infection always depends upon microörganisms which must pass from one individual to another through the air as particulate bodies. Germs are apt to cling to other dust particles. Their number varies with the varying conditions. Out-of-door air contains fewer germs than that within houses. Ordinary ventilation has no noteworthy effect in the removal of dust, either floating or at rest. A large part of the so-called disinfection might be replaced with advantage with proper methods of sweeping, dusting, and mopping. Moist mops should be used on floors, and moist dust cloths on the furniture. The feather duster is a sanitary abomination. The sprinkling of damp sawdust on floors before sweeping gets rid of much of the dust. The infectious diseases of the respiratory tract steadily increase as people are more and more huddled together in offices, dwellings, traveling conveyances, and places of public assemblage. Health authorities should prescribe regulations for cleaning public conveyances and places of public assemblage. These are quite as important as the sanitary disposal of sewage or supervision of food and water supplies.

Human and Bovine Tuberculosis.—

KOSSEL, H. *British Medical Journal,* p. 1445, Dec. 2, 1905.

In studying the tubercle bacillus the writer comes to the conclusion that there are two types, the bovine and the human. The former is pathogenic for man, but probably few cases of human tuberculosis are due to the bovine bacillus. The larger number of human infections are due to the direct transmission of the bacillus from man to man. The prevalence of tuberculosis in cattle is to be treated almost exclusively in the spread of the bovine tuberculosis. These conclusions necessarily lead to the deduction that the destruction of the bovine tuberculosis is to be carried out so far as possible and thus lessen or eliminate the chances of human infection by the bovine bacillus. The danger of infection from the bovine bacillus is not so imminent that present regulations should be further extended or made more stringent. Too great attention directed to bovine sources of infection will lead to a neglect of the much more obvious and certain danger of infection, namely, from man to man. The part played by infection from bovine sources in spreading tuberculosis to man is small in comparison to the danger from a consumptive human being.

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EDITORIAL.

BARON KANEHIRO TAKAKI.

The medical and scientific world have been astonished at the success of Japan in eliminating contagious and infectious diseases from its armies. The saving of life as compared with previous campaigns has been as fifteen to one, calculated on the number killed in battle and dying of wounds. This has been accomplished by making the military surgeon a practical hygienist. The story of these achievements has been repeatedly told, but attention remains to be called to the sanitary aspects of the Japanese naval campaign. To Baron Takaki belongs the credit of having identified the cause of beriberi and of having banished what was once the scourge of the Japanese navy. It is scarcely possible to estimate these services in the late war; without them the signal success of the Japanese in the whole campaign would have been jeopardized, as it was vital that they should command the seas. We take pleasure in publishing a portrait of the director of the Medical Bureau of the Japanese navy, together with a short biographical sketch.

Baron Kanehiro Takaki was born in 1848 in the Province of the Prince of Satsuma, one of the old Samurai family. He was sent to school at the age of seven, and up to his sixteenth year was under instruction in the old Chinese language. He was taught to fence, to use spears, and to ride. Shortly after his sixteenth birthday he began to study medicine by reading translations of Dutch medical works. When eighteen years of age he took part in the revolution of 1868 as one of the assistants on the staff of a field hospital with the army of the Prince of Satsuma, serving for seven months. During the month of July in this campaign 27 men were wounded, two of the cases being of a very serious nature. The surgeons of the staff were unable to treat them properly, and consequently others had to be called in. This so mortified young Takaki that he made up his mind to study medicine thoroughly with the view of retrieving the honor which he felt had been lost to his chief.

Returning to Satsuma he began the study of the Dutch language, which was then considered to be the best avenue to the acquisition of medical knowledge. He wrote to his father, who had supported him up to that time, and said that he would not ask any further aid from him, and would devote his entire time to his medical work. The Prince was good enough to provide for his maintenance, and after completing his course of study he was

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Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

appointed assistant to one of the teachers in the medical school which had been established under the direction of an English physician, William Willis. At the end of the three years' service he was appointed dean of the medical school.

In 1875 Takaki was ordered to England for the further prosecution of his studies. He entered St. Thomas Hospital in London, where he remained for five years. At each examination he received prizes with certificates of honor, and was the recipient of a Cheselden medal after a competitive examination in surgical anatomy. At the end of his course he was given a gold medal for general efficiency and good conduct. At the same time he passed the necessary examinations for the degrees of M.R.C.S. England, F.R.C.S. England, and L.R.C.P. London. With these qualifications he returned to Japan in 1880, and was at once appointed to be the head of the Naval Hospital, and in 1882 was made the vice-director of the Medical Bureau, and in 1883 director.

BARON KANEHIRO TAKAKI.

He at once took up the responsibility of investigating the causes of the ill health of the men of the navy with a view to correcting them. He met with many difficulties, but was eventually able to introduce measures that resulted in the improvement of sanitary conditions, with which His Majesty the Emperor was very much pleased. His views were finally accepted by the minister of the navy, Count Y. Kawamura, and special regulations were issued concerning the food supply, the effect of which was noticeable in two or three months in an improved condition of the general health. The principal malady with which the Japanese marines were affected was beriberi. Under Baron Takaki's régime the number of cases was immediately decreased 50 per cent. This was accomplished by reducing the amount of rice in the rations and increasing the proportions of bread and meat. He demonstrated his theory by experiments on dogs, which were fed one-half on rice, and the other half on barley and meat. Those fed with rice, except one, died before the experiments were completed, while those fed on barley and meat remained well. During the year 1886 the total number of cases of beriberi in the Japanese navy was reduced to three, demonstrating conclusively that Takaki's ideas were correct. In 1889-1890 not a single case appeared. In 1891 he had the honor of reporting personally to His Majesty the Emperor that the dreadful foe of the Imperial Navy had been overcome by the adoption of the new methods.

Baron Takaki was the founder of the Tokio Charity Hospital, one of the best institutions of the kind in Japan. Sixty in-patients and 300 out-patients are admitted daily. In 1882 a training school for nurses was established, from which more than 200 graduates have gone forth, and the present number of students in attendance is 100. Instruction is given the nurse-pupils in anatomy, physiology, hygiene, materia medica, nursing, etc. A medical school is also attached to the Tokio Charity Hospital, the present number of students being 407. The

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English language is taught as one of the necessary subjects, and it is said that this is the only medical school in which the study of English is obligatory. This institution has graduated more than 500 physicians. In addition to these establishments Baron Takaki maintains his own private hospital, where he has accommodations for 100 persons. He was decorated with the new order of Treasurer for his zeal in exterminating the disease beriberi, and was, because of his eminence and in recognition of the great importance of his work, made a baron.

THE LATER KNOWLEDGE OF SYPHILIS.

This disease has baffled pathologists for many years, but at last we are probably on the road to a solution of some of its problems. Metchnikoff and Roux have succeeded in inoculating the disease in monkeys. The variety that is most susceptible is the chimpanzee. In this animal they have produced manifestations of the disease so typical that it was readily recognized by syphilographers. They have also succeeded in transmitting the disease from one animal to another. Since the discovery of the spirochaeta pallida they have demonstrated this organism in at least one-half of the animals inoculated. The evidence so far points with strong probability to this being the distinctive organism of syphilis. It now remains for it to be cultivated on artificial media outside of the body. It would not be surprising if this were accomplished at any time. As soon as it is done then the crucial experiment of inoculating apes with pure cultures will definitely settle the claims of this organism as the causative factor of syphilis. If it should be proven that it is, then the possibilities in the way of more accurate diagnosis of this affection will at once furnish problems for the clinician. It is reasonable to suppose that easier and more rapid methods of staining will be devised. Perhaps no discovery recently made in the domain of medical science will add more to the exactness of clinical medicine than this identification of the cause of syphilis.

MORBIDLY HIGH ARTERIAL PRESSURE.

The increased vascular pressure which accompanies certain kidney lesions has long been looked upon an as unfavorable symptom. Direct therapeutic interference has been undertaken with a view of lowering the arterial pressure, and the treatment of these conditions has been based upon such a theory. Krehl (*Deut. med. Woch.,* No. 47, 1905) claims that the process is by no means as simple as we have been led to suppose. He regards the high arterial pressure in a sense as a conservative process, claiming that the increased vascular pressure will lead to an elimination of substances by the kidneys that would otherwise poison the organism. The correct theory of lowering vascular pressure is to eliminate from the system the toxic agent. This can be done by a milk diet. The value of the latter in lowering vascular pressure is due to the fact that it eliminates from the diet those substances which call for increased activity on the part of the kidneys. In contracted kidney an increased arterial pressure is needed to compensate for the defective functioning. The proper plan of treatment is to lessen the amount of work which the kidney will have to do, when there will be a prompt fall in arterial pressure. It is the necessity of this high arterial pressure that enables the system to resist so effectually efforts to lower it.

We do not pretend to pass on the merit of Krehl's suggestion, but many symptoms formerly regarded as destructive are now looked upon as essentially conservative. Thus fever, which a few years ago was regarded as a grave and destructive symptom, is now looked

upon as a process by which the organism is helped to fight the infectious process. Of course it is recognized that fever may go to a point where the elevated temperature itself becomes dangerous, but ordinarily it is only a part of the reaction of the organism to an infection. It may be that Krehl's suggestion is of the same order. If the high arterial pressure is conservative, it may be taken as an index of the efforts of the kidney to get rid of certain poisonous products. The elimination of these would lead to lowered vascular pressure, and hence less work would be thrown on the kidneys.

THE SHAPE OF RED BLOOD-CORPUSCLES.

For generations medical students have been taught that the red blood-corpuscles were biconcave or biscuit-shaped disks, and that they were composed of a homogeneous stroma impregnated with hemoglobin. Some twenty-five years ago it was claimed that the red cells were nucleated, but this contention was never sustained, and it was believed by most histologists that it was an optical illusion, due to the fact that corpuscles must be observed by reflected instead of transmitted light. Later staining reactions have definitely settled the fact that the normal red corpuscle is devoid of a nucleus. A recent communication by Triola (*Gazzetta degli Ospedali,* Dec. 3, 1905) has undertaken to upset the cherished belief in the biscuit shape of the corpuscles. He claims that these appearances are due to exposure to the air, and that the living corpuscles are circular in shape. This appearance he claims to have demonstrated in the mesentery of the frog by examining it in such a way that it is free from pressure. In the larger vessels of the mesentery the circulation is so rapid that the individual corpuscles cannot be studied, but in the smaller vessels near the intestine the corpuscle appears as a spherical body. As the red blood-corpuscle passes along the artery it has a slow, rolling motion by which all of its sides are exposed to view. At no time was there anything but a curved outline, showing that there is no part of the corpuscle that has a depression. These observations he claims confirm those made by Malpighi, who in 1661 said that the red blood-corpuscles were circular in outline. He also claims to have demonstrated the same spherical outline of corpuscles in blood withdrawn from the body. The method followed was to obtain the blood directly from a vessel or from the heart of an animal by a syringe in which the barrel was coated with vaselin. A drop was allowed to fall upon a slide covered with vaselin, which prevented adhesion. Immediately examined under these circumstances the red blood-corpuscle has a circular shape. A still more heretical doctrine is that the red blood-corpuscle is white.

CLEANLINESS IN FOOD SUPPLIES.

The recent passage by the United States Senate of the bill to regulate interstate commerce in relation to adulterated and sophisticated foods will, it is to be hoped, place upon the statute books an efficient law which will prevent the wholesale adulterations now so prevalent. The tendency of public health authorities and of local boards of health is toward an improvement in the food supply. Much attention has been devoted in the last year or two to the question of clean milk. If a reasonably pure milk supply could be obtained the saving in child life, particularly during the summer months, would be enormous. In the inspection of foods local health boards are no longer content with the mere evidences of decay, but are calling attention to certain defects in the gathering and storing of food supp'ies. The Illinois

State Board of Health in a recent Bulletin urges upon all local health boards, the councils of cities, and the trustees of villages the enactment and enforcement of ordinances prohibiting the sale of poultry, fish, game, or any animal used for food which has not been properly drawn and cleaned at the time of slaughter. They refer to the rapidly growing custom of storing poultry, fish, and game containing the entrails, and offering them for sale long periods of time after being killed. The United States Department of Agriculture in Bulletin No. 144 says: "Under precisely the same conditions of temperature and humidity, drawn fowls will keep from twenty to thirty days longer than those not drawn. The presence of undigested food and of excrementitious substances in animals which have been killed most certainly favors the tainting of the flesh and general decomposition. The viscera are the first parts to show putrescence, and allowing these to remain within the body cannot do otherwise than favor infection of the flesh with bacteria and ptomaines, even if osmosis does not actually carry putrid juices to contiguous tissues. Hunters know the value of drawing birds as soon as possible after they have been shot, in order to keep them fresh and sweet and to prevent their having a strong intestinal flavor."

The Board of Health states that it has become a custom among wholesale poulterers to purchase poultry during the early summer and keep it in cold storage until winter. Such fowls are killed without thorough bleeding and placed in cold storage without removing the viscera. Decomposition is limited by the cold storage, but begins as soon as the carcass is thawed out. Flesh in which the blood has been permitted to remain is particularly susceptible to such decomposition, which is increased by a long period of freezing and thawing. Undrawn poultry, fish, and game have caused many cases of poisoning which have been wrongly attributed to other sources. The protection of the people from these dangerous and repulsive foods lies within the jurisdiction of its officials. Not only should proper ordinances be enacted, but the people should be advised, that they may take none which have been kept in storage with the entrails unremoved.

STOMATITIS DUE TO VULCANIZED RUBBER.

Vulcanized rubber is used extensively in artificial dentures. It is easy of manipulation and relatively cheap. Many who wear rubber plates have long been known to suffer from inflammation of the mucous membrane of the mouth and gums, but this has generally been attributed to a want of cleanliness, stomach disorders, or gout. M. C. Mahé (*La Presse Médicale,* Jan. 27, 1906) calls attention to a form of stomatitis due to rubber dentures. It is characterized by roughness of the mucous membrane of the hard palate or alveolar process, the elevations sometimes becoming fungous and bleeding readily; there is often a foul breath, increased salivation, and more or less gingivitis of the remaining teeth. These troubles have been attributed to the coloring matter incorporated with the rubber. Attfield as early as 1877 asserted that the vermilion used to color rubber was devoid of irritating properties. Notwithstanding the assertion of the eminent English chemist there is considerable evidence that the secretions of the mouth act on the sulphide of mercury used to color the rubber. Celluloid which contains only 0.6 part per hundred has been found to lose its color. This is explained by supposing there is some fermentation in the buccal cavity and not a chemical change. The action on rubber dentures would be greater, as they contain 33 parts in the hundred of mercury sulphide. Recent experimental work has shown that under the action of saccharomyces

cerevisiæ the insoluble sulphide of mercury is split up by certain albuminous compounds, which are soluble. These results have been questioned, and it is claimed that the same phenomena occur with artificial dentures of gold or platinum, but it is by no means certain that they are identical.

THE NOMENCLATURE OF THE ORGANISM OF SYPHILIS.

As soon as Hoffman and Schaudinn had established with some degree of probability that the organism described by them was the cause of syphilis, several articles appeared dealing with the nomenclature. It was claimed that it was not a spirochaeta. Recently C. A. Pfender (*American Medicine,* March 10, 1906) said that under the international code the name for this protozoön is treponema pallidum. The nomenclature of medicine is already so faulty as scarcely to admit of rectification. It is important that in naming any new organism approximate correctness should be reached if possible. Already there have been nearly 300 articles published, which is quite sufficient to give the term first adopted a fair standing in the literature. If the organism is a treponema it should be known early, that it may be properly christened.

ARTIFICIAL ALBUMIN.

The narrow line separating organic from inorganic compounds has been repeatedly crossed. The first step in these important chemical researches was taken when urea was formed synthetically. Since then many compounds that were formerly supposed to be the sole products of animal or vegetable cells have been formed in the chemical laboratory. Naturally only the more simple substances have been dealt with. Until very recently there has been no attempt at the production of so complicated a body as albumin. Upon this problem Prof. Emil Fisher, one of the latest recipients of the Nobel prize, has been at work for many years. His investigations have included a careful study of the chemical bodies known as the amido-acids. If the water is eliminated from these substances they bear a striking resemblance to peptones, which are well known decomposition products of albumin. By synthesis of these artificial peptones he has produced a substance which has a striking resemblance to ordinary albumin. The product which he has succeeded in synthetically forming has many of the physical properties of albumin. It froths when beaten, and when acted upon by the digestive juices of the pancreas it is digested much like ordinary albumin.

ORIGINAL ARTICLES.

OBSERVATIONS UPON THE PHAGOCYTIC POWER OF THE BLOOD OF SUPPOSEDLY NORMAL HUMAN BEINGS.*

BY JOSEPH MC FARLAND, M.D., AND EDWARD M. L'ENGLE, M.D., PHILADELPHIA.

In 1902 Leishman devised a method of quantitatively estimating the phagocytic power of the leucocytes of the blood.[1]

This method was considerably improved upon by Wright and Douglas in a paper entitled "An Experimental Investigation of the Rôle of the Blood Fluids in Connection with Phagocytosis,"[2] and the technical procedures contained in these two papers have been employed by us with such modifications as will be described below. The study of *"opsonins,"* begun by Wright and Douglas,[3] and of late pursued by numerous observers, seems destined to become of practical clinical importance; and it was with the object of determining such variations as might obtain in the phagocytic power of unmodified bloods preliminary to the investigation of opsonins that the observations contained in this paper were made. It seemed to us that before any accurate experimental studies should be made it would be necessary to determine the variability or invariability of the behavior of the blood-corpuscles of different supposedly healthy individuals, so that in future experiments we would be informed as to the possibility of drawing correct inferences from the behavior of the cells from one individual as compared with those of another individual.

It has been our ambition to make the entire technique sufficiently simple to be performed in a clinical laboratory by any one possessing a small amount of technical ability.

In order to perform the experiment, it is necessary to have, first, the living phagocytic cells, and secondly, the bacteria that they are to take up; and it is necessary to bring these two into contact under invariable conditions, in order that correct deductions concerning their interaction may be drawn.

Securing the Phagocytic Cells.—With the minute quantities of blood obtainable from an ordinary puncture in the finger it is inexpedient as well as unnecessary to attempt to separate the leucocytes from the other blood-cells; and as the red corpuscles and the non-phagocytic lymphocytes do not in any manner affect the activity of the phagocytic white cells distributed among them, they can be permitted to remain, no attention being paid to them in the final microscopic examination. Moreover, by having these elements present there may be more nearly perfect correspondence between that which goes on *in vitro* under the conditions used and that which takes place *in vivo* during infection.

The first difficulty that has to be overcome is the undesirable coagulation of the blood, which by entangling the corpuscles in the crysomentum makes it impossible for the bacteria to be brought into uniform contact with them. Two methods can be utilized for this purpose—defibrination of the blood, as is commonly employed in hemolytic investigations, and decalcification, as recommended by Wright and Douglas. It might be suggested that decalcification, by the addition of sodium citrate, naturally brings about an abnormal chemical condition of the blood; and it is quite proper to

*Read at the meeting of the Society of American Bacteriologists, Ann Arbor, Michigan, Dec. 28, 1905.

[1] *Brit. Med. Jour.*, 1902, vol. i, p. 73, Jan. 11.

[2] Proceedings of the Royal Society of London, lxxxii, p. 357, 1904.

[3] Proceedings of the Royal Society of London, lxxii, Sept., 1903.

inquire at once whether this variation will have any bearing on the activity of the phagocytes and their attitude toward bacteria. This was carefully investigated by Wright and Douglas, who found that the addition of the necessary quantity of citrate of sodium had no influence whatever upon the behavior of the blood-corpuscles.

To secure the citrated blood, we make use of a very simple pipette, easily made in the laboratory in a few minutes, and perfectly satisfactory so far as our experience goes. It consists of a thermometer tube about six inches long, with a caliber of one millimeter, drawn out in the flame of a blow-pipe so that it is pointed at one end where it is to contact with the drop of blood, and narrowed and rounded at the other for the attachment of a small rubber tube. The rubber tube should be sufficiently long to enable one to work conveniently with the pipette while the end of it is held in the mouth, and it should have a short glass mouthpiece so that it can be quickly closed by the tongue. Enough mercury is sucked up into the tube to form a column about five centimeters in length. The finger is then used to close the end of the pipette so the mercury cannot escape. A mark is made at the upper end of the column of mercury, the tube held horizontally, the finger released from the end of the pipette, and the mercury coaxed by gentle tapping into a position where its lower end corresponds to the mark where the upper end originally stood. A second mark is now made at the upper end of the column, thus giving us two segments of the pipette of exactly the same capacity. We have not found it necessary to determine the cubic contents of these segments, as it is immaterial for the purpose for which the tube is intended. The mercury is now expelled and the tube is ready for use.

To prevent the coagulation of the blood a one-per-cent solution of sodium citrate in an .85-per-cent solution of sodium chloride is employed. In using the pipette the column of the citrate of sodium solution is carefully sucked up until the first mark is reached. By using the pipette in a horizontal position it is not difficult to stop the flow of fluid at any desired point by closing the end of the rubber tube with the tongue. The pipette is next applied to a drop of blood drawn from one side of the ball of the thumb, and the blood is sucked in until the citrate solution, ascending in advance of it, reaches the second mark. The end of the pipette is then wiped off and the contents blown out into some small glass receptacle, and sucked up and blown out of the pipette once or twice in order to secure thorough mixing. The blood is then ready for admixture with the bacteria.

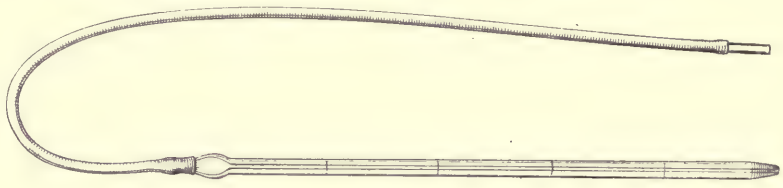

FIG. 1.—Pipette for making the mixture of blood and citrate of soda solution.

The bacteria used in all of our experiments were staphylococci, and we soon found, as our predecessors had done, that it was essential to bring into contact with the corpuscles uniform quantities of the bacteria in order that uniform results might be obtained. Our method of securing this uniformity was, however, very different from that of Wright,[1] who enumerated the bacteria. This seemed to us a rather tedious procedure, and one the difficulty of which so complicated the technique that the

[1] *Lancet*, July 5, 1902.

accuracy obtained did not compensate for the expenditure of time and labor. The necessity for using standardized bacterial suspension is easily determined, and our experiments show the variation in the number of bacteria taken up by the leucocytes to vary with almost mathematical certainty according to the dilution employed. Thus, a suspension of bacteria was made, a portion diluted with an equal volume of physiological salt solution, a portion of this further diluted with an equal volume of salt solution, and a portion of this still further diluted with an equal volume of salt solution. We thus had four suspensions, representing one-half, one-fourth, and one-eighth the original number of bacteria. The counts were as follows:

Original suspension 8.375
First dilution. (Through an accident we were unable to count the bacteria contained in this specimen.)
Second dilution 4.7
Third dilution 2.85

It occurred to us that uniformity in the number of bacteria in the suspensions employed could be secured with reasonable accuracy by some means of measuring and standardizing the turbidity of the fluid containing them. We therefore devised a simple instrument, for which we suggest the name *nephelometer* (*νεφελη*, mist, cloud, fog), by which it became easy to secure any desired degree of turbidity. We first prepared a one-per-cent solution of barium chloride; secondly, a one-per-cent solution of sulphuric acid in distilled water. Then from these we made ten solutions of the sulphuric acid, using respectively 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 per cent of the barium chloride solution. These gave us ten different precipitates to be used as turbidity standards. About three cubic centimeters of each was placed in a small test-tube and the top sealed in the blow-pipe flame. With the aid of a box-lid and a strip of stiff linen we next prepared a holder into which the tube containing the desired precipitate could be stood for comparison with the tube of salt solution in which the bacteria were to be suspended, the comparative turbidity of the two being observed through small slit-like orifices against a bright sky, or preferably a white cloud. We have found that *the tube containing five per cent of barium chloride corresponds to the most useful bacterial suspension.*

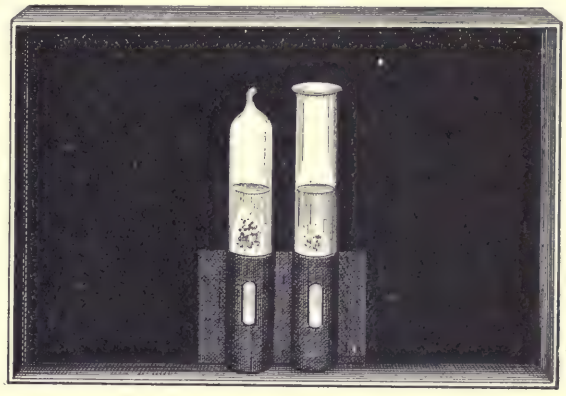

FIG. 2.—The nephelometer. The standard of turbidity is contained in the sealed tube on the left, and the bacterial suspension in the open tube on the right, made to correspond by the addition of more bacteria if too thin, or more salt solution if too dense. The comparison is made through the small fenestra against a white cloud.

The bacteria were always secured from 24-hour old agar-agar cultures, which we found it easy to mix in homogeneous suspension with the physiological salt solution.

As recommended by Wright and Douglas, the contact of the citrated blood containing the phagocytes with the bacterial suspension was permitted to take place in capillary glass tubes prepared for the purpose by drawing out an ordinary piece of glass tube in a blow-pipe flame until it was about the diameter of a lady's hatpin. Slight variations in the diameters of these tubes are unimportant, though Wright and Douglas have shown that great variations, as, for instance, between tubes several millimeters in diameter and tubes of hair-like fineness, cause variations in the results obtained. It seems unnecessary to calibrate these capillary

tubes with mercury. The portion of the tube to be used, being about fifteen centimeters in length, should be uniform to the eye. The caliber is then fairly uniform throughout. With a blue pencil one makes a mark upon the tube about five centimeters from its end, and a second mark five centimeters above. A small rubber tube is attached to the upper end of the

HUMAN BLOOD AND SUSPENSION OF STAPHYLOCOCCUS PYOGENES AUREUS.

A. C. B.	11.67	26.725
B.	7.2	7.6
S.	15.6	24.25
C.	7.75	10.425

When the duration of the exposure exceeds thirty minutes, the number of contained bacteria becomes so great as to interfere with the successful count of the bacteria contained in the leucocyte. On this account we have uniformly exposed our mixtures for thirty minutes. Doubtless the phagocytes are active at temperatures less than 37°; but as we are endeavoring to approximate *in vitro* what takes place *in vivo,* and as in every well-equipped laboratory an incubator is always running at 37° C., our experiments have all been performed at that temperature. At the end of this time it will be observed that sedimentation of the blood-corpuscles has taken place to one side of the capillary tube. This shows the importance of laying the tube upon its side instead of standing it upon end, and also shows the importance of mixing the contents by whirling the tube between the fingers for a minute or two before discharging them.

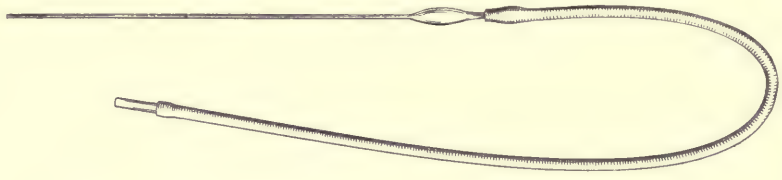

FIG. 3.—Capillary tube for mixing the citrated blood and bacterial suspension.

tube, which may be narrowed for the purpose, and the citrated blood is drawn up to the first mark. The bacterial suspension is now drawn in until the contained fluid reaches the second mark. If the glass tube from which the capillary tube was made has a caliber greater than three millimeters, it may not be found possible to mix these two solutions in the pipette; and it will then be necessary to blow them out upon a glass slide with a concavity, drawing them into the pipette and blowing them out once or twice to secure their mixing. After mixing, the fluid is drawn into the capillary portion of the tube, the end of which is sealed in a flame. The mixture of citrated blood containing the leucocytes and the bacteria must now be placed for some time in the thermostat at 37° C., at which the human leucocytes become active and phagocytosis takes place.

Striking variations in the results obtained may arise from inattention to the length of time that the phagocytes are allowed to remain in contact with the bacteria. This is shown by the following experiment, in which preparations made as described were examined after thirty and sixty minutes' sojourn at a temperature of 37° C.:

Method of Enumerating the Bacteria and Estimating the Phagocytic Power of the Blood.—The slides and cover-glasses employed should be cleaned with sulphuric acid, water, and alcohol, in order that they may be free from grease and other impurities. When the half-hour has expired and the time has come for the bacteria to be enumerated, the end of the capillary tube is broken off and sufficient of the contents dis-

charged upon a clean cover-glass to enable one to prepare a satisfactory film by the ordinary method of superimposing a second glass and sliding it off. After drying in the air without the application of heat, the specimen is stained by some method that will enable one easily to differentiate the varieties of leucocytes and distinctly see the bacteria they contain. Of the various methods for staining the blood, we have found that of Marino[1] to be most satisfactory, in which the following solutions are employed:

SOLUTION NO. 1.

Methylene blue	.5 grain.
Azur II	.5 grain.
Water .....100.	grains.

SOLUTION NO. 2.

Carbonate of soda.....	.5 grain.
Water .....100.	grains.

These two solutions are mixed and allowed to remain in the thermostat at 37° for forty-eight hours. At the end of this time a .2-percent solution of eosin in water is added and the fluid is filtered through paper. The precipitate, after drying in the air, is dissolved in pure methyl-alcohol in the proportion of .04 gramme of precipitate to twenty cubic centimeters of alcohol. This is the stain.

For differentiation a 1:10,000 eosin solution is employed.

Directions for Staining.—The cover-glass upon which the film is spread is held in an appropriate cover-glass forceps. Four small drops of the blue solution are allowed to fall upon it from a dropping-bottle, and permitted to act for exactly three minutes. The methyl alcohol fixes the film to the glass.

Then without washing add from 8 to 10 drops of the eosin solution and allow it to act for exactly two minutes, during which time the staining takes place. The fluid is poured off and the preparation quickly washed in distilled water, dried, and mounted in Canada balsam. Properly prepared specimens show the erythrocytes to be stained a faint transparent green color. The cytoplasm of polymorphonuclear leucocytes is almost hyaline and has a faint pink color. The nuclear structure is beautifully shown, and the contained bacteria stand out clearly, their color being brilliantly blue. The eosinophile cells show the oxyphile granules stained a brilliant red color. The small lymphocytes are brilliantly blue. The large lymphocytes show a transparent nucleus and a hyaline cytoplasm of a pink color which varies in intensity. The blood platelets are distinct, occur in small groups, and are violet in color and granular in appearance.

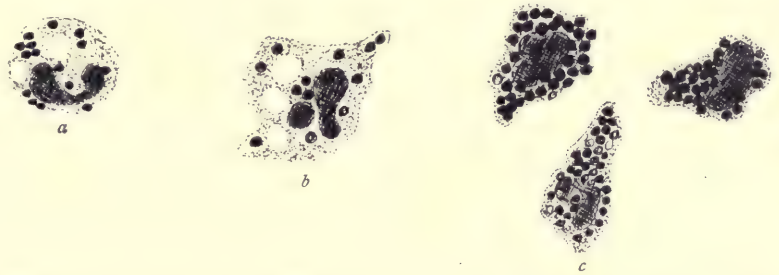

FIG. 4.—Leucocytes containing staphylococci *a* and *b* after 30 minutes' exposure, *c* after 60 minutes' exposure, according to the method described, at 37° C.

The bacteria will be found scattered over the entire field, varying numbers of them being taken up by the polymorphonuclear leucocytes, and a few by the large lymphocytes.

Method of Enumerating the Contained Bacteria.—The use of a mechanical stage renders the enumeration of the bacteria more easy and certain, though it is in no sense indispensable.

[1] *Annales de l'institut Pasteur*, 1904, vol. xviii, p. 761.

We are in the habit of counting the number of bacteria in the first twenty polymorphonuclear leucocytes observed and then averaging. In all our examinations we have made two enumerations. The exact method of doing this varies according to the condition of the spread blood, but other things being equal the first count is made upon cells contained in the upper left-hand fourth of the cover-glass, and the second enumeration upon cells in the lower right-hand fourth of the cover-glass. We have also endeavored to have each enumeration of twenty cells done by a different observer, so that personal equation might be eliminated.

Original Observations.—By these methods we have now studied the bloods of twenty-four supposedly healthy individuals, all of whom were students or laboratory workers, with the

SYNOPTICAL TABLE SHOWING THE RELATION OF THE PHAGOCYTIC ACTION OF THE LEUCOCYTES OF SUPPOSEDLY HEALTHY PERSONS TOWARD STAPHYLOCOCCI.

Class I.—Positive History of Past or Present Disposition to Suppuration.

(All these persons are *well* at present and have no lesions.)

	Acne.	Furuncles.	Carbuncles.	Appendicitis.	Pneumonia.	Abscess.	Gonorrhea.	General health.	Phagocytic count.
Prk.	+	24 or more remembered	Remembers 1	0	0	0	0	Excellent	5.55
Sml.	0	Numerous	Many, some within year	0	0	0	0	Good	4.65
Sth.	0	Numerous	0	0	?	0	0	Good	4.125
Opf.	0	7 or more remembered	0	0	0	0	0	Has asthma	11.25
Cre.	+	Numerous	0	0	0	1 on ankle	0	Excellent	9.7
									5)35.275
								Average.....	7.055

Class II.—Vague Past History of Suppurations.

	Acne.	Furuncles.	Carbuncles.	Appendicitis.	Pneumonia.	Abscess.	Gonorrhea.	General health.	Phagocytic count.
Hfm.	0	A few 15 years ago	0	0	0	0	+	Good since typhoid	10.7
Dmd.	0	0	0	0	0	1 seven years ago	0	Good	14.
Cst.	0	+	0	0	0	0	0	Good	12.65
Cli.	0	0	1 long time ago	0	0	0	+	Excellent	6.2
Bkn.	0	+Some time ago	0	0	0	0	0	Excellent	7.2
Chtm	0	+Some years ago	0	0	0	0	+	Excellent	7.75
Stu.	0	+Twenty years ago	0	0	?	0	0	Good	11.8
Bris.	0	0	0	0	0	0	+	Excellent	8.2
									8)78.50
								Average.....	9.81

Class III.—No History of Any Suppuration.

	Acne.	Furuncles.	Carbuncles.	Appendicitis.	Pneumonia.	Abscess.	Gonorrhea.	General health.	Phagocytic count.
Bkg.	0	0	0	0	0	0	0	Excellent	13.57
Btn.	0	0	0	0	0	0	0	"	12.57
Rch.	0	0	0	0	0	0	0	"	9.75
Gllw.	0	0	0	0	0	0	0	"	11.3
Shn.	0	0	0	0	0	0	0	"	15.6
Dlg.	0	0	0	0	0	0	0	"	15.71
Mgr.	?	0	0	0	0	0	0	"	9.67
Hks.	0	0	0	0	0	0	0	"	23.125
Hlg.	?	0	0	0	0	0	0	"	19.2
Bkg.	0	0	0	0	0	0	0	"	11.67
Dlg.	0	0	0	0	0	0	0	"	23.2
									11)165.365
								Average.....	15.033

B. J. C.

results shown in the accompanying tabulation, from which it becomes evident that there is no normal standard of phagocytic energy for supposedly healthy individuals, but that their corpuscles may vary between 23.2 and 4.125. It seems to us that these results have a direct and important bearing upon the subject of *opsonins,* and their variation in health and disease. Wright and Douglas, who first employed the term "opsonins" (Lat. *opsono,* I cook, I prepare pabulum for), consider them to have clinical importance, and much work has already been done by workers in various countries in investigating them, especially in relation to tubercle bacilli and tuberculosis.

Opsonins may be defined as substances in the blood serum which act upon the bacteria, preparing them for phagocytosis. Washed leucocytes brought in contact with bacteria normally taken up by them fail to manifest any phagocytic action. Washed leucocytes suspended in heated serum also fail to take up bacteria, so that the whole process of phagocytosis seems referable to the preparation of the bacteria by thermolabile substances contained in the serum.

In all the recorded experiments, the opsonic power of the blood, or "opsonic index," is determined by comparisons with normal blood, but our observations indicate that so far as staphylococcus is concerned, the normal variations are too wide to enable many conclusions to be drawn. It would seem to be impossible to establish a general standard of comparison corresponding to "normal blood," and it seems to us that the only satisfactory method of making comparative opsonin observations would be by comparing the various readings of a given blood with one another.

We hope to make opsonins the subject of a further communication.

We have been able in two cases only to repeat these counts upon different days. Thus, the phagocytic index of the leucocytes of Stm. was enumerated after a five days' interval, the first enumeration yielding the result 15.6 and the second 9.95. On the day the second enumeration was made, Stm. was taken ill with a mild attack of influenza. The blood of Prk. was examined after a similar interval, the first count being 5.55, the second 5.22. Here in one case there is a distinct variation, in the other a remarkable uniformity. It has been pointed out (Meakin and Wheeler[1]) that the opsonic index of the blood varies at different times during the day, apparently according to the activity of the individual; and lest it might appear that we had been inattentive to this detail, we wish to state that all of our experiments have been made between the hours of three and five in the afternoon.

It was our hope to give these observations some practical clinical bearing, and the continuance of our work will be in the direction of studying the phagocytic index of the blood in various morbid conditions. It is interesting to note what remarkable correspondence there is between the phagocytic index and the history of suppuration in the cases tabulated.

CONCLUSIONS.

1. Leishman's method of determining the phagocytic power of the blood, as modified by Wright and Douglas and by ourselves, is a very simple method adapted to clinical application.

2. Marino's stain is very satisfactory for demonstrating the leucocytes and the contained bacteria.

3. There is no uniformity in the phagocytic indices of the bloods of supposedly healthy individuals.

4. The phagocytic index of the same individual may be constant, or it may vary upon different days, according to the health of the individual.

5. An exceptionally low phagocytic count

[1] *Brit. Med. Jour.,* Nov. 25, 1905, p. 1396.

usually indicates a present or past predisposition to suppuration (the phagocytic index in this regard being determined by the use of staphylococcus pyogenes aureus).

6. The phagocytic index may not be below the average in all cases in which there has been a tendency to suppuration.

7. The wide variations from the phagocytic index of supposedly healthy individuals seem to indicate that for staphylococci at least there must be equally wide variations in the "opsonic index."

8. Such variations in the opsonic index suggest the impossibility of establishing any other standard of comparison than the blood of the patient himself.

THE AFRICAN POISON TEST AS OBSERVED IN THE PORTUGUESE COLONY OF ANGOLA, WEST AFRICA.

BY F. C. WELLMAN, M.D.

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Introduction.—Much has been written by travelers from time to time regarding the very weird and extraordinary custom practiced by the savage tribes of tropical Africa for the purpose of settling disputes among themselves, and usually known as "the poison test." It has been remarked that these various accounts do not agree as to the details of the custom, and several writers have been accused of being inaccurate observers. The truth is that both the ingredients and manner of administering the test differ among different tribes, and the reason for the varying descriptions is to be sought in the facts themselves. It follows, then, that a description of the procedure holds good only for the people and district where it was drawn up, and it is therefore desirable that we should have careful studies of each variety of poison test in order that later a comprehensive survey may be made of a custom which has nearly depopulated whole districts and has been responsible for more deaths in Africa than have many important diseases. In the intervals of some patho-geographical investigations undertaken in Angola during 1904, the writer was able to collect some information regarding the locally employed ingredients and *modus operandi* of the ordeal as seen in the interior of that colony among the Umbundu-speaking Bantus. In accordance with what has been said above, the following observations must not be taken as necessarily true of the custom in other parts of Africa.

Name and Synonyms.—The name used by the Bantus is "Ombulungu." The Portuguese colonists generally refer to it as "Juramento." Synonyms are "a justicia de Deus," "Ombambu," "Wanga," "Mulianyi," "Bauve," "Muavi," etc.

History of the Custom in Angola.—The native history of the "Ombulungu" is of course nothing more than a mass of oral tradition, but after questioning a number of chiefs and old men I am inclined to the opinion that the custom did not independently originate among the Umbundus, but was introduced from the east or northeast.[1] I do not adopt this view from statements of the natives, although these bear out such an opinion, but after considerable study of the naive allusions to the custom contained in their proverbs, folk-lore, etc. The poison test has been known to the Portuguese from the time of their settlement of Angola,

[1]These remarks, of course, refer only to the rise of the custom in Angola. It is hardly necessary to refer to the well known fact that some form of trial by ordeal was a very widespread ancient custom not confined to Africa. Other ordeals—*e.g.*, by fire, boiling water, etc.—have long existed among the Zulus and other Bantu peoples.

and stringent laws have been passed against it, it being contrary to the code for a captain-general or other administrative colonial officer to recognize the custom. This regulation is, however, unfortunately too loosely observed, and I know personally of one case where a lieutenant advised a native chief to go to the poison test with his accuser, and have been informed (in one instance by an army officer) of a number of perplexing cases sent to the "Ombulungu" by captains-general. One officer was even stated to have administered the ordeal himself, using two glasses of water, in one of which was dissolved tartar emetic. The custom has thus not only failed to disappear, but, according to those competent to judge, flourishes to-day in the interior almost as actively as in the past.

Occasions of Appeal to the Poison Test.—An effort is generally made by the head men of a village to settle disputes amicably and satisfactorily to all parties. This can usually be effected except in three classes of cases:

1. Hereditary cases, or those which date back to a time preceding the memories of the disputants.

2. Mysterious cases of murder or other crimes of which there is no evidence to convict the accused.

3. Cases of alleged killing by witchcraft.

The first class of cases often date from the petty wars or plunderings of former chiefs. Under the second class fall many adultery cases, and the third has arisen from the primitive idea that no one need die unless an enemy kills him. Of course there are occasional cases relating to debts, and also to wives, slaves, or other property (and also to disputes regarding antelope, hippopotami, and other large game wounded by one person and killed or found dead by another) which do not fall under these headings, although such disputes are often settled by village chiefs. In the case of failure to agree on a decision the parties as a rule go first to a witch-doctor and attempt to settle their claims by divination. The systems of divination (called variously "Taha," "Ongombo," "Ongiki," etc.) are of great interest, but their consideration lies without the scope of this paper. If divination fails the aggrieved party then challenges his antagonist to the ordeal of poison, a refusal to meet which is tantamount to a confession of guilt.

Methods of Conducting the Ordeal.—The first preliminary after the test has been agreed to is to decide upon a witch-doctor who is acceptable to both parties to prepare the poison. Then each party ties up and delivers into the hands of a disinterested person a free-born boy or girl as a hostage to insure payment of the penalty (often a fine of cattle or slaves) which will be exacted in case of his death. Now the two companies, consisting of the litigants, their friends, and relatives, proceed, usually by separate routes, to the village of the witch-doctor, who may be several days away, and to whom each party has previously forwarded presents, bribes, and assurances of the sender's innocence. Each man's friends, too, use all their personal influence to win over the witch-doctor. It will be seen by this that it is always decided beforehand who is to be acquitted and who convicted by the ordeal. On the day appointed there is usually a crowd of natives to see the spectacle. The litigants appear, and after each has solemnly asserted his innocence in a long speech, or by oath, drink the poison. There are several methods of administering the test, which I may briefly describe:

1. The first of these is to mix two small gourds full of apparently identical concoctions, each litigant drinking the contents of a gourd. Trickery and suggestion (at both of which savages are experts) are brought into play to place the deadly gourd in the hands of the devoted individual. The imposture is so palpable, however, even to the credulous native, that this method is now almost obsolete, and the demand

is usually made that both drink from the same gourd.

2. I have heard of a "one-gourd method," according to which the poisons are mixed and allowed to settle, the person drinking last getting the fatal dregs of the cup.

3. The method which I saw carried out was as follows: The poisonous substances are dried, powdered with various others, and placed in the bottom of a small gourd, where they are carefully covered with the resinous exudation from the "Ulemba" tree (*Ficus psilopoga* Welw.). On top of this is poured an evil-smelling mixture of different harmless solutions. Over the surface of the liquid is sprinkled a light-colored powder. The witch-doctor with many mystic incantations and flourishes stirs the mess a couple of times with his finger, taking care not to touch the bottom. Then the fortunate party whom it is proposed to acquit drinks. The mixture is again stirred, this time scratching the resin at the bottom and liberating the poisonous substances. After a few minutes of ceremonies and rites to gain time for the poison to thoroughly permeate the whole the draught is once more stirred, and the victim (who is always made to drink last) quaffs to his doom.

4. Another method, similar in principle to the foregoing, is to have a skin bag with two compartments, one containing the poisonous powdered substances and the other an innocuous powder of the same color, sprinkling these in turn over the top of an inert mixture.

After the drinking has taken place the witch-doctor gives the command to dance. Drums are beaten, and the litigants dance a native dance, capering back and forth over a space of fifty meters long. Soon the poisoned one shows symptoms of dizziness and falls to the ground, to be carried off by his friends to die or recover, according to the strength of the potion given him. The convicted person's relatives must now pay all the claims of the acquitted,[1] and whole families frequently become slaves in this manner.

The Ingredients Employed.—The plants which are used in various parts of Africa are many. Some of these which have been especially studied are *Strychnos icaja* Baill., *Physostigma venenosum* Balf., *Erythrophlæum judiciale* Proct., *Tanghinia venenifera* Poir, *Adenium somalense* Poir, and *Menabea venenata* Baill. None of these plants are used in the poison test of the Umbundus. The principal ingredient is, however, an *Erythrophlæum* (*E. guineense* Don.), which may be combined with either or both of two other poisonous plants, viz., the "Utata" bush (*Securidaca longipedunculata* Fres.) and, more rarely, the "Okalembe" bush (*Tephrosia vogelii* Hook. fil.).[2] I was once told that the "Ochimbinga" plant (*Strophanthus sp.*), formerly employed to poison arrow heads, is also used, but later inquiries failed to corroborate this statement. Several *Ebenaceæ* were also once pointed out to me in the same connection. Perhaps a remark on each of the three most used substances may be in place. Technical descriptions of the plants are not given, as they may be easily looked up in the published systematic books and papers of Oliver, Welwitsch, Ficalho, and others.

1. *Erythrophlæum guineense* Don. (*Leguminosæ*). Closely related to the type *E. judiciale* Proct., used in many parts of tropical Africa for the same purpose. It is a large tree with rough bark, handsome acacia-like leaves, fragrant flowers, and a rather large, oval, smooth, yellow fruit which, although acrid when green, is sweet and edible when ripe. The bark of the root is used. This bark when powdered and inhaled causes sneezing. The aqueous extract when injected under the skin of animals causes vomiting and shortly irritates, and later paralyzes the vagus nerve, causing the heart to slow and at last to stop. I admin-

[1] In case the accused is acquitted he insists on the payment of an "Ombalu"—*i.e.*, indemnity for being unjustly accused.

[2] Some deny that *T. vogelii* is ever used.

istered a piece of bark two inches square and one-third inch thick, ground up and mixed with water, to a small native dog. Its limbs were paralyzed in twenty-one minutes, and it died in one hour and two minutes.

2. *Securidaca longipedunculata* Fres. (*Polygalaceæ*). A large shrub with small fleshy leaves and rose-colored flowers. The inner bark of the root contains an active poison. I prepared four grammes of this bark by boiling in 30 Cc. of water and gave it to a large female mandril (*Cynocephalus sp.*), called "Epundu." It produced death in forty-eight minutes. The roots are often used by the native women to commit suicide. The method as described by them consists in placing small quantities in the nostrils, ears, armpits, and vagina; but in the only case which fell under my notice an emetic brought up generous quantities of the drug from the stomach. The roots when cut or bruised give off a strong odor of *Oleum gaultheriæ*.

3. *Tephrosia vogelii* Hook. fil. (*Leguminosæ*). A small shrub cultivated in fields or villages by fishermen. I have not tested this plant, but a few handfuls of the leaves bruised and thrown into a small stream stupefy or kill all the fish for a long distance down stream. The plant is also sometimes mixed with food and employed to kill enemies.

Effects of the Poison Test.—As has been said, a number of inert substances are invariably mixed with the poisons. The effects of the general mess as administered are first vomiting and purging. Later the limbs seem to be affected, and the victim falls to the ground, and dies with apparently little suffering. Various glucosides, alkaloids, etc., prepared from poison-test ingredients have been studied. Erythrophlein, the active principle of the chief ingredient of the test under discussion, has been experimentally shown to produce dyspnea, vomiting, diarrhea, slowing of the heart's action, suffocation, and death. It will have been noticed that all of the methods of administering the "Ombulungu" are open to error, and accidents involving either the "innocent" party alone, or even both partakers, undoubtedly occur.

OBSERVATIONS.

The psychological and evolutionary aspects of the custom would repay study, but only a few general remarks can be included here. The natives when questioned attribute the decision to "Suku" (God or chief spirit), but believe that the "Olosande" and "Ahamba" (good and evil spirits or angels) have an influence, and offerings are made to these before going to the ordeal. Offerings are never made to "Suku," as he is conceived only as the creator who has handed the affairs of the world of men over to the "Olosande," "Ahamba," etc., and is only to be approached through these. When pressed as to the matter of deception the natives take refuge in the familiar and unassailable theological position that even the trickery and deceit may be controlled by the spirits. The custom must be (judging from its elaborate ceremonies, traditions, etc.) an old one. Just how it arose and the circumstances of its introduction into Angola are interesting problems. It should be sternly put down by administrators and not winked at, even though, as is now often the case in Angola, modifications (the most common of which is probably the omission of the most dangerous ingredient, *Erythrophlæum*) are adopted in order that it be not invariably fatal.

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THE EYES AND EARS OF SCHOOLCHILDREN.[1]

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So much has been written on the subject expressed by the title of this address that a literature of its own has developed, and it is quite impossible to write more upon this theme without indulging in much repetition and recapitulation. I feel especially apologetic in this regard, as I have for ten or eleven years appeared almost constantly in print on this subject, and feel that I have but little more to say, except to urge activity on the part of physicians, educators, and legislators, that the good work already begun may be promptly finished. Nevertheless, you have kindly invited me to address this body of health officers, and the honor so courteously extended has found in me a ready responsiveness, for I never can and I fear never will have strength to resist a call to talk upon my favorite theme. Therefore, my colleagues, I present myself before you prepared as of yore to again do battle for the eyes and ears of the coming generation, realizing fully that I have nothing new to offer, but believing that, like some good old books and music, repetition can do no harm, and feeling that the last word will not be said upon this subject until every boy and every girl in the civilized world shall have had the enormous benefit of annual physical examinations and proper medical supervision, which shall fit them as far as may be for the work of acquiring an education without physical disintegration.

The public schools are a public trust, through whose portals all parents should confidently and confidingly lead their offspring, feeling that when the care of these young lives is transferred to the supervision of the school authorities they are safe from harm, and will at least be handed back to them in as good condition as they were at first. That good and creditable work along these lines has been and is being accomplished is unquestionably true, and conditions are immeasurably better than they were ten years ago, but much work remains to be done, and until the annual and proper physical examination of *all* schoolchildren shall have been accomplished, those having the interest of the coming generation at heart should press on, battling for the right, until victory is perched upon their banners.

It should never be forgotten that is is said there are in the United States alone to-day almost 20,000,000 schoolchildren; that about 8,000,000 of such children suffer from some ear, nose, or throat disease which also impedes their school progress, and that a vast majority of such abnormal conditions can be either cured or materially alleviated by early medical interference, and will become chronic or incurable if neglected. Think of it! There are in this country about 16,000,000, or 80 per cent, of schoolchildren suffering from some eye, ear, nose, or throat disease which can be easily detected and generally cured, if the public health and educational authorities will only decree that this work shall be done! Is it hard to do? No. Is it expensive? No. Is it in any way objectionable? No. Can it be easily and effectively accomplished? Yes. Then why is it not done?

My imagination is not always active, and for this defect I humbly beg my hearers' pardon, but to the best of my knowledge and belief the reason for the non-accomplishment of this plain duty on the part of hygienists, educators, and

[1]Read Jan. 18, 1906, in Columbus, Ohio, before the Local and State Boards of Health of Ohio.

legislators is simply apathy, neglect, or politics. Can such authorities not rise from the level of the past to the heights of the present and of the future, and offer this tardy reparation to the poor and neglected children of this country, who must some day control its destinies? I believe that they can, and that they will, and that the next few years will disclose the full fruition of the devoted labors of the past.

It may also be of interest to know the financial aspect of the situation, as this phase of a problem will often exert a potent influence when all others fail, and the fact that the people of the United States have about $700,000,000 invested in public schools may add a dignity to the situation and stimulate a desire to have the visible representations of this immense amount of money managed in the best possible manner, which is quite impossible unless the schoolchildren of this country are in good physical condition.

It may also interest students of sociology to know that there are in the United States over 300,000 blind people, many of whom would not have become blind if their disabilities had been detected during school life, and that it costs the public in the neighborhood of $15,000,000 to care for these unfortunates. Reducing the question then to the mere sordid standard of money, is it a matter of public economy to neglect the eyes of schoolchildren?

We should remember also that over 50,000 American children are annually removed from school on account of debilitated physical and nervous conditions brought on by physical incapacity and injudicious mental pressure. Such children, being unable to acquire a suitable education, fall by the wayside, grow up in invalidism and ignorance, and help to fill the ranks of the weaklings, the worthless, and the criminals.

It would seem almost unnecessary to produce an array of arguments with the object in view of convincing those having such matters in charge of the necessity for the annual and systematic examination of schoolchildren's eyes and ears, for it is an undisputed fact that healthy eyes and ears are quite essential to the ready acquirement of an education, and yet it is but natural to presume that where the proper authorities do not take decisive action along these important lines they cannot be fully awake to their duties and responsibilities. It seems then essential to remind them that almost all children are born with reasonably healthy eyes and ears, and that such conditions as myopia, hypermetropia, devastating inflammatory conditions, etc., are usually due not only to possible inheritance, but to malnutrition, excessive study under improper conditions, neglect, lack of judicious medical attention, etc., etc., most of which could and would be corrected if the situation was thoroughly understood and studied. I claim that such an understanding is quite impossible without annual systematic examinations. The sporadic care of this child and that child does not suffice; the general and kindly observation of children by even willing and intelligent teachers, with occasional advice to students and parents that medical advice be sought, is not enough, for generally no attention is paid to such unofficial suggestions, certainly not as much as would be paid to a formal printed notification of the child's imperfect physical condition; and besides this, many important and serious diseases may exist without exciting the observation of the average teacher.

The myopic eye is a diseased eye proceeding from small degrees of short-sightedness to those of enormous extent, accompanied by disastrous ocular congestions, detached retina, etc., all fostered by excessive study under improper conditions, such as bad and meager illumination, insufficient outdoor life, lack of proper glasses, etc. The average increase in myopia during school life is about 20 per cent. In

Germany, the land of bad print and profound students, this proportion is increased to about 60 per cent. The hypermetropic eye renders study exceedingly irksome by producing headaches, tired eyes, nervous exhaustion, etc., thus sowing the seeds of illiteracy, ignorance, and idleness, all of which might be prevented by timely detection and medical intervention, coupled with the correct adjustment of glasses. Inflammatory ocular conditions, such as the various forms of conjunctivitis, keratitis, etc., besides being foci of more or less dangerous contagion to other children, produce conditions making suitable study impossible and improper, and again provide scholars that are a burden to their teachers and encourage the swelling of the ranks of the idle and the outcast. Nasal and throat hypertrophies such as turbinated enlargements, and polypoid, adenoid, and tonsillar growths, produce deaf children, unable to absorb ordinary education, and discharging ears, which not only induce deafness and may be a menace to life, but necessitate the production of microörganisms, which should exclude such children from school, owing to their menace to the health of other scholars.

The pity of it is that practically all of such conditions, and many more too numerous to mention, could be cared for and cured if detected early in life, by the annual systematic examination of all schoolchildren's eyes and ears; and of the various methods that have essayed from time to time to accomplish this purpose, the simple examination by schoolteachers is the only one that has been even reasonably successful, and is surely the only one that contains sanguine prospects of becoming universally adopted. Such examinations would be made if only all health and educational authorities, aroused to the importance of the situation, would issue their separate orders that such examinations *must be made;* the pity of it is, they do not do it. A large proportion of the idle and criminal classes is being supplied and resupplied, as generation after generation of children are thrown upon the world, by children who for some reason or other have failed to acquire the education which enlarges and uplifts the soul and character, and opens up avenues for honorable and useful employment. Visit the criminal courts, the reformatories, the jails and prisons, and how often do you find lawbreakers who have been plucked from the ranks of the educated? Occasionally, it is true; but the great rank and file of these offenders are men and women of meager or no education. Some, it is true, are natural criminals, the offspring of criminal parents, but even here there must have been a beginning, proceeding some generations back, perhaps from some ancestor who was deprived of an education by some physical defect, possibly of the eye or ear. The great mass of criminals, however, are not born offenders, but become so through associations and lack of a cultivating and ennobling education, which is, of course, impossible if physical defects place such an education beyond their reach. I have no desire to magnify my theme, and do not by any means believe that all crime could be expunged from society by the correction of physical defects of children, but I earnestly believe that there is enough real matter in this subject to claim the fixed attention of sociologists, health and educational authorities, and lawmakers, both as a matter of moral obligation and public economy.

The physical condition of our children reaches down then to the very substructure and foundation of society. The boy of to-day becomes the man of to-morrow, to whom we and succeeding generations must look for the advancement and prosperity of our country. The child cannot act for himself, and often the parent is equally helpless, or careless. It behooves us, therefore, who have such matters in charge to act for him, and to act wisely and

well. His physical and moral as well as his intellectual status and progress should be closely watched and guarded, and probably no avenue through which he can be reached is so important and accessible as the public school. Here he spends most of his waking hours, and it is here that his body, mind, and heart should be under the strictest surveillance. The school requests, nay enforces, his attendance, and volunteers to superintend the unfolding of his young life in its most critical period. It is, then, the obvious duty of school-teachers and authorities to note well their important and self-assumed obligations, and to give the child the benefit of the best and most modern thought and judgment upon this sacred and important subject. Our schools undoubtedly provide opportunities for great intellectual advancement, and I believe that the general moral tone of our schools is of a high quality, but what of the physical condition of the scholar?

I believe we must all view with pride the marvelous evolution of our public schools and our educational system, notwithstanding the fact that over ten per cent of the children of this country can neither read nor write. But while viewing with satisfaction the marked advance, during the past twenty years, in means and methods of teaching, I contemplate with peculiar satisfaction the care for and development of the body that is now evident in all schools, and which must rightfully be largely attributed to the untiring work and writings of the medical profession. Witness the playgrounds with their gymnastic apparatus, the baseball, football, and golf teams; observe the sanitary buildings, well lighted and ventilated; notice the well built and adjustable desks, the well printed books, the good drinking-water and clean cups; see the careful seating of the scholars with reference to their vision and hearing, not forgetting the conscientious supervision of each scholar's physical condition by the average room teacher and the medical school inspector. Such observations must make us realize that progress has indeed been made, and that while much remains to be done, we have no reason to feel ashamed of the advances and accomplishments of the past, and have much occasion to believe that the future holds in its hands the full fruition of all our hopes.

Two things are necessary to raise corn—one is the seed, and another is a favoring soil and conditions. So it is with the enlightenment of the young. The means of education are necessary, viz., the buildings, properly placed, constructed, and conducted, including systems, books, etc., etc., and *then* the child with the receptive mind and healthy body and senses, capable of receiving instruction and profiting thereby. We are surrounded by the *means* of education, for modern schools with their effective machinery are a source of gratification and delight to all, but enthusiastic, progressive, and systematic educators do not always consider the *soil* upon which the seed of enlightenment falls; in other words, they are disposed to consider children as a massed entity, and do not separate them into isolated individuals with distinct inheritances and mental and physical peculiarities, rendering them more or less adaptable to the requirements of the modern public school. Children are thrown into the great machinery of school life, are divided into grades, and are expected to adhere to them, and become educated according to a certain system. A child may have a weak or crooked back, which will become aggravated by close confinement at improperly constructed desks; he may have lungs handicapped with the incipient germs of tuberculosis, encouraged by the protracted inhalation of vitiated school air; he may languish from general systemic impoverishment, and pine and droop under too much study and too little fresh air. These are some of the conditions noticed in schoolchildren mili-

tating against the easy acquirement of an education, but more directly essential still are the existence of certain abnormal conditions of the organs of special sense of seeing and hearing, which are certainly of prime importance in the imbibition of presented instruction. If a child cannot see well and hear well, his position is certainly most unfortunate in the modern public school, where he is expected to keep up with his grade work or else subject himself to chagrin and mortification.

Do not understand me as saying that our schools are likened to the Car of Juggernaut that ruthlessly throws down and crushes all who unfortunately come in contact with its destroying wheels. Far from it. I fully appreciate the gentle, humane, and sympathetic feelings that proceed from the hearts of most teachers toward those children committed to their care. I am not unaware of their watchfulness and solicitude over their little flock, that prompts them to change the seats of the deaf and near-sighted, to make allowances for any noticeable physical or mental shortcomings, to frequently visit parents and urge upon them the necessity of action concerning the health of a child; but these are isolated though frequent instances inspired by individual sympathy and character, and restricted by necessary ignorance of such subjects on the part of the teacher. What we want is a paternal systematic school system of health investigation, by which the physical defects of children will be made manifest, and steps taken to protect pupils against themselves, and in many instances against their parents. We also want a system that, after these unfortunate conditions have been discovered, will not only *allow* but *insist upon* the harmonizing of the studies to the child, and not the child to the studies. I am not unaware of how often this is done; that a doctor's certificate of poor health is usually respected; that the course of study is sometimes changed under the advice of the parent or teacher; but I think I am not wrong in saying that these changes are comparatively infrequent and so little encouraged that children will often endure much physical discomfort, or even suffering, rather than assume the chagrin and mortification brought upon them by the unenviable distinction of a grade change. These changes should be inspired from the intelligent illumination of regular physical examinations, and should be so common as to excite no comment and give rise to no loss of a pupil's self-respect, or disappointment on the part of the parent, who frequently allows a child to languish and acquire permanent invalidism rather than interfere with his class standing or the date of a projected graduation. I would not be understood as advocating the abolition of systems and grades. It is needless to say that schools cannot be properly conducted upon other principles. Neither do I advocate the *indiscriminate* changing of grades, without just and adequate consideration. Neither do I ignore the fact that grades are frequently changed for good and sufficient reasons. I advocate more systems and more grades. I advocate a system of physical examination in schools by which we may *know* the condition of a child's health, and not trust to chance or circumstance to detect it, and I advocate more and shifting grades, commensurate with the physical condition of defective children. In other words, I do not believe in the wholesale education of the rising generation, which is our country's hope, its bulwark, and defense, and whose physical as well as its moral and mental condition is a sacred trust which we must guard and cherish. I do not believe in thrusting these little, yielding, impressionable, often sickly lives, into a common crucible to be molded and turned out with identical exactitude and precision. I believe that children should not be damaged by their educational existence, but should emerge from the portals of the

American public school in better physical, mental, and moral condition than when they were entrusted to its fostering care, and that steps should be taken calculated to bring about the fulfilment of this plain and imperative duty.

While the physical examination of children should include *all* children, rich or poor, young or old, it is to the poor and neglected child that they must of necessity become the most useful. The children of well-to-do and intelligent parents are usually, though not always, well cared for through parental love and solicitude, and their slightest ailments ministered unto by the medical adviser, but it is quite otherwise with the children of the tenement, the hovel, and the slums, who frequently are parentless, or, God knows, might better be. If education is worth anything in the broadest sense, and if it passes beyond the borders of dilettanteism into the broad realms of those influences which stand for human uplift, then it should reach down, down to the very dregs and bottom of the social scale, and pull up the most unfortunate of the human race and place them on a par with their fellow men. You and I both know that education will perform this great evolutionary process, and I claim that it is the inalienable, inborn right of every citizen of this great, magnificent Republic to be placed in a position where an education may be acquired, for to education we must look for the solution of many of the sociological and criminological problems of the day, the solving of which means much for the betterment and happiness of our Fatherland. If obstructions exist militating against this Utopian condition, which are relievable by acts undertaken by the guardians of the public welfare, they should not shrink nor hesitate in the execution of their duty, but should cheerfully and promptly perform such acts, and if necessary vicariously assume the office of father and mother to those who are bereft either by death or unfortunate condition of the benefits of such benignant influences.

The responsibilities of school authorities along these lines is enormous, and involves, amongst other things, such questions as the location of school buildings with reference to air (Billings says that children should have 30 cubic feet of fresh air each minute for each child), space, noise, and drainage; the construction of the building itself with regard to window space, and the direction of light, proper ventilation, plumbing, and heating; the necessity for good and artificial illumination; the prevention of overcrowding; the necessity of medical inspection before and during school life; the use of proper drinking-water and cups; the providing of washstands, towels, etc., that will be free from contagion; the construction of desks of differing sizes for differing ages; the use of desks that are of the proper slant and height, and compel an upright position in reading and writing; the frequent intermission from studies, and the change from one study to another, thus compelling a combined rest of eyes, mind, and body; the proper regulation of the means of study, such as the distance and color of blackboards, the color of slates, the character of print, and the paper on which it is printed; the necessity for vaccination; the exclusion of contagious diseases, and the exertion of advisable quarantine regulations; the placing of scholars in grades suitable for their physical and mental conditions; the forbidding of too many studies, in order to prevent much home study; the supervision of games, sports, etc., and the general physical health of scholars. These and many other problems must be met and solved by school authorities, and upon their wise and conservative opinions and acts depend very largely the ocular and aural health of children and the general well-being of the coming generation.

One of the most important topics for those

who manage schools to consider is the proper care of children during the period of adolescence, or, in other words, between the ages of about 14 and 18. During the course of this wonderful unfolding of Nature's purposes the nervous, mental, and physical condition of the child is in a peculiarly sensitive and precarious condition. Nature is busy with her physiological changes, the child's resistance is taxed to its utmost, and during this important epoch of existence the individual should surely be relieved of all unnecessary physical, nervous, and mental taxation. This is not the time for excessive study, either at school or at home; it is not the time for grade vaulting, or extreme mental activity; and yet how often do we see children, ambitious themselves, perhaps, or forced to unduly studious habits by ambitious parents or teachers, paling and fading away from overapplication, until a broken-down constitution, thus early in life, proclaims the folly of the undue prosecution of a prevailing error.

One of the most interesting investigations that have been recently made concerning the relations existing between the ocular conditions and mental development has been undertaken by Gelpe, who has examined 578 physically defective children and found that 419, or about 72 per cent, had defective eyes, and that the worse the mental condition of the child, the worse the eyes were found. A very large majority of these cases were improved by treatment, glasses, etc., showing what can be done even with children of feeble intellect by intelligent examination and care. He shows that a predisposition to feeble-mindedness, congenital or otherwise, may certainly become active or be aggravated by various ocular defects, especially by uncorrected refractive errors. He compares defective visual organs to an ill-adjusted objective of a photographic camera, imparting to the retina and the brain indistinct images, thus putting such a severe strain on the nervous system as to handicap the mental development of the child. He found the significant fact that myopia decreased in direct proportion with the decrease of intelligence, and found that in these children of defective mentality myopia existed in about 12 per cent of the cases, hypermetropia in about 32 per cent, while astigmatism occurred in 30 per cent of the cases. These data are most interesting, and, I believe, fully coincide with the opinion of those who have observed many children of low physical or mental development.

The title of my paper indicates that I am here to speak to you about the eyes and ears of schoolchildren, and while I have, perhaps, wandered far from my subject, I contend that it is but a narrow specialist who believes that these organs are separate kingdoms, to be separately considered; they are a part of the body corporate, and must be regarded as merely sections of the human frame, and largely dependent upon the other portions of the body for their intrinsic health and well-being. Consequently it is quite impossible to intelligently discuss the eyes and ears of schoolchildren without at least having something to say concerning the more comprehensive topic of the general well-being of the children themselves. I trust, therefore, that I will not be considered as specializing too much when I say that I believe it to be merely stating a truth when I affirm that aside from mental capacity there is nothing so essential to the acquirement of an education as good eyes and ears, for without them the pathway to an education must be thorny indeed. The examination of these organs of special sense by physicians is no novelty, and has been accomplished many times for the purpose of gathering statistics, and doing good. The employment of physicians for this work, however, has been well proven to be practically impossible, as it involves too great an annual expense, and almost invariably

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produces so much professional jealousy and friction as to place an efficient quietus upon any future investigations. For the purpose, therefore, of overcoming these two objections, and yet of accomplishing the end in view, I proposed in February, 1895, that such examinations should be annually and systematically performed by school-teachers, and that any scholars found to be defective should be furnished with what I call a "card of warning," which is to be handed to the parent. This card simply notifies the parent that his child is believed to have some eye or ear disease which impedes his progress in school. The parent is urged to consult his family physician, or some eye or ear surgeon, either at his office or free dispensary. The card does not *insist* upon such a consultation, and leaves it entirely open as to which physician shall be consulted. In this way no physician sees the child until the parent voluntarily escorts the patient to some medical man of his own choice; this, of course, does away entirely with any professional friction, or any suspicion of collusion or favoritism.

In order that the presence of disease may be detected by the teacher I have arranged a series of nine questions, absolutely plain and simple in their character, for which the teacher is to obtain the answers. They are, for instance, such questions as these: "Does the pupil habitually suffer from inflamed lids or eyes?" "Does the pupil fail to read a majority of the letters in the number XX line of Snellen's test types with either eye?" "Does matter or a foul odor proceed from either ear?" "Is the pupil a habitual mouth-breather?" It will be observed that these questions are so primitive in their character that any teacher worthy the name can easily furnish answers to them, and yet the nine questions are so comprehensive in their significance that when correctly answered they will disclose the existence of 90 per cent of serious eye, ear, nose, and throat diseases. The teacher, however, should not feel that she is expected to furnish a diagnosis of the child's disease, she is only expected to know that some abnormal condition exists. The diagnosis and treatment are left for the physician. These tests should be made as soon as possible after the opening of the fall term, as this is not only the most convenient time for the work, but it will also give the teachers a long opportunity of following up the tests and watching the effect of medical treatment. The tests should be made by the room teachers, as they are more familiar with their scholars' infirmities, and such a subdivision of labor imposes no hardship upon any one. A schoolroom can easily be examined in a day, which means, of course, that every public school child in any city can be examined in a day, provided each teacher does her own examining; or if it is preferred, a few pupils could be kept after school each day, and the entire work accomplished easily in one week. The extra work thus expended by the teachers will be generously rewarded in the end by the transforming of dull students to bright ones by medical treatment, glasses, deafness relieved, etc., for who does not know the nervous exhaustion experienced by teachers in endeavoring to instil knowledge into the minds of children who are suffering from eye or ear defects?

As a complete description of the tests will be given at the end of this address it will be unnecessary to further describe the method at this juncture, and I will merely say in answer to many inquiries that the expense of making these tests is so nominal that it is really not worth considering. For instance, a large city containing 5000 schoolrooms can have a testing chart with testing letters and instructions to teachers printed on it for every room by an expenditure of about $200. The expense for "warning cards" and simple record blanks need not exceed $100. A city like Chicago

can, therefore, have this work thoroughly accomplished by the expenditure of a little time, labor, and $300. The testing charts and teachers' instructions can be used for years if carefully preserved. It will, therefore, be seen that the question of expense is quite immaterial and need not be considered; the only question involved is an honest determination to see that this important work for the coming generation is annually and properly accomplished.

In order to facilitate the work and bring it more fully before the profession, I secured at the New Orleans meeting of the American Medical Association the passage of the following resolutions, both in the Ophthalmological Section and the House of Delegates:

Whereas, the value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures, therefore, be it

Resolved, that it is the sense of the American Medical Association that measures be taken by boards of health, boards of education, and school authorities, and, where possible, legislation be secured, looking to the examination of the eyes and ears of all schoolchildren, that disease in its incipiency may be discovered and corrected.

Since then these resolutions have been adopted by the Mississippi Valley Medical Association and by the State medical societies of the following States: Minnesota, Colorado, Illinois, Montana, New York, Indiana, North Dakota, Rhode Island, Alabama, Michigan, Utah, South Dakota, Delaware, California, Massachusetts, Arizona, West Virginia, Kentucky, Louisiana, Nebraska, and Washington.

The resolutions have also been adopted by the American Public Health Association, by the State and Provincial boards of health of North America, and by the State boards of health of the following States: Kansas, Minnesota, Colorado, Wisconsin, North Carolina, Vermont, Illinois, Montana, New York, Indiana, Connecticut, Ohio, North Dakota, Rhode Island, Alabama, Pennsylvania, Maine, New Hampshire, Michigan, and Utah.

The resolutions have also been adopted by the State boards of education of the following States: Texas, Kansas, Minnesota, Colorado, Wisconsin, North Carolina, Vermont, and Connecticut.

Besides this the tests are being placed in operation in the government schools in India, and in hundreds of schools in America where they are not required by school authorities.

It will thus be seen that the work is progressing, and I assume from the fact that I have been invited here to speak upon this subject that the State of Ohio, always foremost in excellent public service, intends to vigorously undertake this important step. Two State legislatures, Connecticut and Vermont, have incorporated this movement in a public law, and in the last message of the governor of Massachusetts to the legislature he strongly recommends that the annual systematic examination of public schoolchildren's eyes and ears be ordered by the lawmakers of that State. The Connecticut law reads as follows:

SECTION 1. The State Board of Education shall prepare or cause to be prepared suitable test cards and blanks to be used in testing the eyesight of the pupils in public schools and shall furnish the same, with all necessary instruction for their use, free of expense to every school in the State.

Section 2. The superintendent, principal, or teacher in every school, some time during the fall term in each year, shall test the eyesight of all pupils under his charge, according to the instructions furnished as above provided, and shall notify in writing the parent or guardian of every pupil who shall be found to have any defect of vision or disease of the eyes, with a brief statement of such defect or disease, and shall make written report of all such cases to the State Board of Education.

The Vermont law reads as follows:

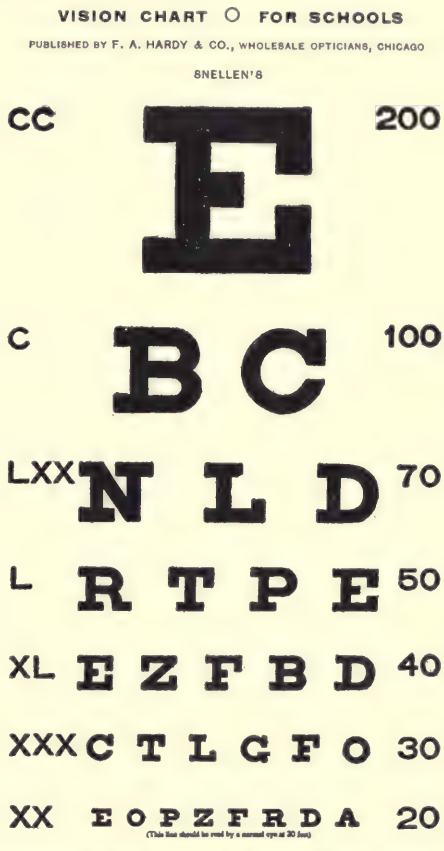
SECTION 1. The State Board of Health and the superintendent of education shall prepare or cause to be prepared suitable test cards, blanks, record books, and other needful appliances to be used in testing the sight and hearing of pupils in public schools, and necessary instructions for their use; and the Superintendent of Education shall furnish the same free of expense to

every school in the State. The superintendent, principal, or teacher in every school during the month of September in each year shall test the sight and hearing of all pupils under his charge, and keep a record of such examinations according to the instructions furnished, and shall notify in writing the parent or guardian of every pupil who shall be found to have any defect of vision or hearing, or diseases of eyes or ears, with a brief statement of such defect or disease, and shall make a written report of all such examinations to the Superintendent of Education as he may require.

Section 2. The State Auditor is hereby directed to draw his order on the State Treasurer for such sums and at such times as the Superintendent of Education, with the approval of the State Board of Health, may require to carry out the provisions of this act. The total expense under this act shall not exceed Six Hundred ($600.00) Dollars in any biennial term ending June 30.

Section 3. This act shall take effect July 1, 1905.

The Vermont law seems to be the better of the two, not only because it specifically states that the examinations shall be made in September, but particularly because it includes ear defects (which, of course, means also nose and throat defects), which is of the greatest importance. It is to be hoped that the Connecticut law will be amended to fulfil this requirement. It is also to be hoped that these tests will become a law, and an active, living law, in every State of this country, but to effect this the combined medical energy of the profession in each State is a positive necessity. The American Medical Association resolutions should be passed by every State medical society, and active committees appointed to induce the State boards of health and education to likewise adopt them and to actively undertake the work. If this can be done an act of legislature is hardly necessary; still if this can be accomplished it is certainly a vast improvement, and should always be effected where possible. It should be remembered, however, that legislatures are hard to move, and only convene once in two years, while boards of education and health are more susceptible to measures of this kind and can be reached at almost any time. I would, therefore, advise that those interested in the matter should first secure the coöperation of their State medical societies and boards of health and education, and then secure suitable legislation on the subject wherever it is possible.


VISION CHART ○ FOR SCHOOLS

PUBLISHED BY F. A. HARDY & CO., WHOLESALE OPTICIANS, CHICAGO

SNELLEN'S

CC 200

C 100

LXX 70

L 50

XL 40

XXX 30

XX 20

(This line should be read by a normal eye at 20 feet)

DETACH BY CREASING ON THIS LINE.

INSTRUCTIONS FOR THE EXAMINATION OF SCHOOL CHILDREN'S EYES AND EARS, ETC.

(AFTER THE METHOD PROPOSED BY DR. FRANK ALLPORT OF CHICAGO, ILL.)

FOR USE OF PRINCIPALS, TEACHERS, ETC.

Do not suppose the card except when in use, as familiarity with its face leads children to learn the letters "by heart."

Have grade children noted not be examined.

The examinations should be made privately and singly.

Children who habitually wear glasses should be tested with such glasses presently adjusted on the face.

Place the "Vision Chart for Schools" (Snellen's) on the wall in a good light; do not allow the face of the card to be covered with glass.

The line marked XX. 20. should be seen at twenty feet, therefore place the pupil twenty feet from the card.

Each eye should be examined separately.

Let the pupil cover the eye that is not being examined. Do not press upon the covered eye, as the pressure might induce an incorrect examination.

Have the pupil begin at the top of the test card and read aloud down as far as he can, first with one eye and then with the other.

FACTS TO BE ASCERTAINED.

1. Does the pupil habitually suffer from inflamed lids or eyes?
2. Does the pupil read the line marked XX. 20. when at the number XX (20) line of the Snellen's Test Types with difficulty?
3. Do the eyes and head habitually grow watery and painful after study?
4. Does the pupil appear to be "cross-eyed"?
5. Does the pupil complain of ear-ache at either ear?
6. Does mother "pull" or a fluid odor proceed from either ear?
7. Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room? Each ear should be tested by having the pupil hold her hand over first one and then the other. The pupil should close her eyes during the test.
8. Is the pupil frequently subject to "colds in the head" and discharges from the nose and throat?
9. Is the pupil an habitual "mouth breather"?

If an affirmative answer is found to any of these questions, the pupil should be given a card of warning to be handed to the parent, which should read something like as follows:

CARD OF WARNING TO PARENTS.

If only an eye disease is suspected, the words "ear, nose and throat" should be erased; if only an ear disease is suspected, the words "eye, nose and throat" should be erased; if it is only a nose and throat disease, the words "eye and ear" disease be erased; etc.

It will be observed that these cards are non-obligatory in their nature. They do not require anything of the parent who is of perfect liberty to take notice or the warning sent or not, as he sees fit. They simply warn the parent that a possible disease exists thus placing the responsibility upon the parent.

Nevertheless, if parents neglect the warning thus conveyed, the teacher should even insist to the extent of endeavoring to convince such persons of the advisability of such treatment. Many times this will be sufficient to impress upon pupils and parents the necessity for consulting reputable physicians.

Three tests should be made especially at the beginning of the Fall term, and also at such all children enter the first grade.

Each teacher should commence all the children in his or her own room, and should not use the results of such examinations in the principal, such report to be signed by the examining teacher.

The following sample form of report, to be filled out by the teacher and handed to the principal as suggested and may be printed upon paper of any size and character that is deemed advisable by the local school authorities, and should be distributed to the different room teachers.

No.	Name or Pupil.	Do the eyes appear all Right, Red, Inflamed, Watery, Crossed? Left Eye. R. Eye.	Was the pupil able to hear the Watch Ticking? L. Ear. R. Ear.
1	John Doe	Yes Yes	Yes Yes
2	Robert Smith	Yes Yes	Yes Yes
3	Mary Brown	No No	
4	Edward Neat	Yes Yes	Yes Yes

Let me then ask you, and through you all boards of health and education, all legislatures, and all who are interested in the physical and

moral welfare of our children, do you believe that bad vision and hearing constitute an important barrier to the reasonable and easy acquirement of an education?

Do you believe that a vast number of children are thus embarrassed?

Do you believe that a great benefit to the children, to society at large and mankind in general, would be effected if such physical defects could be detected and relieved?

Do you believe that some such plan as I have proposed would be instrumental in largely relieving such defects?

Do you believe such a plan to be practical, unobjectionable, and inexpensive?

I think you must all answer "Yes" to each one of these questions. Then may I ask you still another question: Why do you not take up this work and carry it through? I address this interrogation to those who by reason of their public offices have the power to enact rules and laws calculated to produce beneficent results on the public at large. I, as a private individual, can do nothing, but you as board of health officers can do much. Will you do it?

72 Madison Street.

THE LAWS AND TEACHINGS OF THE ANCIENT HINDUS IN THE ART OF LOVE.[1]

BY WILLIAM LEE HOWARD, M.D.

Probably the earliest of highly developed thoughts by any Aryan race was that formulated by the Hindus in their personification and worship of Nature. This has been handed down to us in the Vedas, hymns to the deified natural forces and phenomena that these prehistoric immigrants found about them. Especially is this so in their deification of sexual life and phenomena. They identified the world with one god, and that one and the whole world with the self of individual, thus arriving at the most intensely idealistic system ever constructed by man. Here we find morality was a religion; with us religion is supposed to be morality.

The study of sexual activities and generation was the basis of ancient Hindu theology. The reverential worship of the sex organs had a pure motive and moral results. There were two sects—the worshipers of Siva, at other times Roudra, who had on his left arm a ring on which was portrayed the two sex organs in the act of procreation (*Verenda utriusque sexus in actu copulationis*). On Vishnu's forehead is traced a trident-shaped symbol. The middle line reaching to the nose is red and is intended to represent the menstrual flux; the lines on each side are of an ashy-gray color, and on them are representations of spermatozoa.

The naturalistic religion of India commenced with the worship of Siva, but soon became confused with the worship of the virile organ. In introducing sensuality to everything pertaining to religion the Brahmans had two objects: First, to attract to their sect Buddhists by the means of their sensual images and religious exercises. Especially successful was this means of getting converts among the ignorant and gross-minded Hindus, who were incapable of appreciating delicate sentiments and ideas. It was the representation of mythological scenes by the means of sculpture that attracted the lower classes. These rock-hewn pictures of sexual life had remarkable merit, not so much from their form, but the appearance of movement, the details, and the reality of the sexual act. Un-

[1]Abstract of a paper read by request by Dr. Wm. Lee Howard, before the Baltimore Neurological Society, Nov. 16, 1905.

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doubtedly some of the reasons for spreading these pictorial text-books on the art and science of copulation were concessions to local cults and mysteries anterior to the conquest.

The second object of the Brahmans was the fundamental one, and had nothing in common with the diplomatic and expedient one just mentioned. It is indicated by the prescription of Manu: "Let each one acquit himself as well as his ancestors. One should have more than one son to close his eyes at death."

The erotic and naturalistic religion was founded by the adoration of Siva, but gradually became corrupted into a fetishism—the worship of the virile organ. Representations of the penis were encountered throughout all India, and even at the present day are to be seen. In the time we are speaking about they were erected along all the public roads, in places of worship, in private and public gardens.

It is impossible in the short time at our disposal to give you anything like a connected and literary story of the sexual laws and arts as laid down in the Kama Soutra (Art of Love) by Vatsyayana. I shall only be able to give a few of these interesting facts. The lessons they teach and the physiologic reasons I also shall have to leave to your judgment. This work is considered the book of first rank in the theology of the ancient Hindus, although there are many others upon the same subject. One of these is called the "Theatre of Love." It treats of thirty subjects, and gives one hundred and thirty recipes or prescriptions. Here are a few of the principal ones: How to hasten the orgasm of the female: how to retard the same in man; Aphrodisiacs; Manner of making the toilet of the female organ; The art of depilation; Recipe for facilitating the menstrual flow; To prevent hemorrhages; To purify and avoid odors; To prevent abortion; To enlarge the breasts; How to tease, charm, fascinate, and subjugate your husband; Fumigations to excite the genesic instinct.

The Kama Soutra is distinguished from all the other works on the same subject by its didactic character. It is divided into several parts, and each part is a catechism—a catechism of the sexual conduct to be observed by those who wish to avoid quarrels, divorces, masturbation, sexual neurasthenia, scandals, and insults.

There is the catechism for the women of the harem, for the young man who wishes to honorably express his love, and the lengthy instruction book for the courtesan. It is a precious historical document, for it initiates us into the home, morals, and schools of the high-class Hindu of two thousand years ago.

The immorality of the pagan Romans has attracted many writers by the poetry and art which accompanied their licentiousness, but a careful reading of the "Art of Love" will show us the great superiority of the Hindu's attempts to place sexual love on a physiologic basis. The Hindu poets do not sing of voluptuousness, of selfish pleasures, or describe abnormal sexual orgies in their armies. Vatsyayana attempts to give such teaching and precept as will redound to the sexual satisfaction of the woman, and so she will happily conceive. His work is altruistic when we view it alongside of those lewd pictures of Roman life as drawn by the poets of Tiberius's time.

Another advantage the Indian possessed over the Romans was the decent external communication and social conduct between the two sexes. The high classes of India knew nothing of the beastly orgies of the Romans, and pederasty was punished by death. All boys were taught this precept: "Never abuse in any manner a woman—she is as delicate as a flower."

Nevertheless after these pleasant compari-

sons have been made we must not forget that eroticism played the principal rôle in the Hindu religion.

One of the first qualifications for marriage for a high-class Hindu woman was the possession of the sixty-four liberal arts. These covered what we know as the liberal arts with a number of physiologic and sexual facts which it would be well for the women of to-day to understand.

A divorced woman, even if she was high-born and claimed to possess the sixty-four qualifications, was an outcast, for she had not learned thoroughly the lessons. If she had she could have kept her husband.

What were some of these important lessons?

She should be well drilled in all the precepts and information given in the Kama Soutra, and understand practically when and where to use this knowledge.

The instruction should be given by a married woman of her caste, or by a woman especially trained for this work. She should be instructed in the various methods and situations for performing the sexual act. These methods are numerous and ingenious, and the well instructed woman should be able to make her husband believe that each night he has a different partner.

Men were prohibited under penalty of ostracism to have intercourse with the following: Lepers, lunatics, those rejected by their caste, a woman who has told her husband's secrets, those who publicly expose their desire for copulation, albinos—they were considered diseased—and those who had a disagreeable odor.

Among the many kinds of sexual unions there were seven that were strictly taught, and the young women were prohibited from using all but the first. This was the spontaneous union, which explains itself. A union that was especially to be avoided except in cases to be mentioned later was that of artificial love—that is, the use of artifices for enlarging the male or shrinking the female organ. Thorough instruction is given in a category of the sexual natures of the different classes of women from their physiologic and anatomical make-up, as well as their geographical distribution.

When a marriage is anatomically unfit there are certain conditions which permit the use of artificial means for enlargement of the male organ, or for the constriction of the female organ. These artifices were invented by the women, says Bathravia, a noted Hindu writer.

It is permissible in women of the harem, among certain widows, and those whose sexual sufferings are bringing about the form of hysteria, or madness as our author says, to use an artificial penis. Among the ancient Hindus these objects were known as apadravas. They were of various sizes, according to the capacity of the recipient. Bathravia says they were made of gold, silver, leather, iron, ivory, horn of buffalo, wood of different sorts, copper, and skins; they were fragrant and costly, according to the value of material and workmanship. The priest permitted and rather encouraged the use of these accessories as long as they formed no obstacle to fecundation. Later these silent partners were imported into Rome (Lucien).

Certain plants were used to enlarge the penis, a decoction being made and the organ wrapped up in it for a time. Also certain insects (chenilles) were used, being allowed to rest on the penis for a while, and producing rapid engorgement of the organ. The female had her methods of contracting her canal, and Bathravia gives instruction to a prostitute how to pass herself off as a virgin, although warning her that the pleasure will be greatly

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diminished. The women of India use similiar methods to-day.

The use of an artificial penis goes back to time out of mind; yet it is present to-day. The Prophet Ezekiel mentions the use of the phallus. Also Herodotus gives details of the mysteries where maidens paraded the streets each with an imitation turgid penis, the testicles caressingly supported by their hands. Phallic worship exists to-day among certain tribes in Africa, and only a short time ago the late Professor Rosse, of Washington, gave an account in his city of a big, black negro sitting on an improvised throne, penis erect, decorated with colored ribbons, being worshiped by women, white and black.

In Canton, China, and on public sale in most of the cities of that country, can be bought, ready for use, an artificial penis. It is made of a gummy and resinous material, about the color of a pale-red rose. They are exhibited in the shops alongside of pictures representing the manner in which they should be used, with other drawings showing a party of young girls assisting each other in this salacious pastime. The instrument is attached to the fingers. To-day in Paris the maiden who has the addresses, and there are many, can purchase a perfect and artistic artificial penis with testicles. It is a work of art. Its interior, filled with warm milk, immediately causes it to partake of the character of the male organ. Introduced into the vagina the rapid motion imparted to it by the user produces the proper psychical effect, and at the moment the orgasm takes place the warm liquid is expelled. These instruments have reached America, and to my knowledge have been in use in one boarding-school in the East.

And yet, the profession and laity ask why are nervous diseases so prevalent among our women?

A similiar instrument is made in Japan. Its action is caused by mercury being placed in the outer end, and the movement of the girl's thighs accomplishes the object desired.

It is by no means a pleasure to recite such facts, but facts they are, and only by a thorough understanding of these secret vices can we understand certain vicious nervous and mental diseases.

IS JUGULATION OF ACUTE DISEASE POSSIBLE?[1]

BY W. C. ABBOTT, M.D., CHICAGO.

By the term "jugulation" is meant the breaking up of an attack of acute disease in the early stages, preventing the development of later phases, and bringing about the restoration of health in a very much shorter time than would be required were the malady to pass through its usual course. Our views as to the possibility of jugulation will depend to some extent upon the pathology of each special disease; the problems being different in the case of affections depending upon microörganisms, animal and vegetable, and those in which the attacks are believed to be directly due to alterations of the circulatory equilibrium, caused by exposure to cold, heat, or other cosmic influences. We will take up the latter supposition first.

A man is exposed to cold and wet of such a nature as to violently destroy the circulatory equilibrium, driving the blood forcibly from the surface of the body and causing it to accumulate in some circulatory area in the interior of the body. As a result we have a hyperemia

[1]Read before the Chicago Academy of Medicine, Jan. 12, 1906.

of some one or more of the internal organs, which is apt to go on through the successive stages of an acute inflammation, the distention of the blood-vessels being followed by diapedesis of the white corpuscles, rupture, with the escape of the red cells, and effusion into the tissues, resulting finally in destruction of the tissues with suppuration, or in resolution and the restoration to health.

Now if this process be simply a mechanical one it seems obvious that if the first stage, that of dilatation of the blood-vessels, be forcibly removed by therapeutic means the following stages will be prevented, since they follow upon this first stage necessarily, according to the laws of mechanics. If the abnormal pressure within the blood-vessels be removed there will be no transudation or rupture of their walls. The problem is therefore narrowed down to the possibility of accomplishing this object. Here we find a wide divergence in opinion. The physicians of former days universally believed that they jugulated acute inflammatory attacks by the use of the powerful agents then in vogue for reducing vascular pressure, bleeding and evacuants. They insisted that the time for doing this was at the earliest possible moment in the attack, and the ever-present lancet offered the ready and effective means for accomplishing this object. Emetics, cathartics, antimony and mercury, with the local application of leeches, cups, blisters, and poultices, with low diet and abstinence from fluids, completed an exceedingly effective though destructive method of accomplishing the object in view. The profession of that day was practically unanimous in its belief that they not only could but did thus jugulate acute inflammations.

When these powerful weapons fell from the feeble hands of their enervated successors, they were not replaced by any effective substitutes. Expectancy and pessimism held sway, and when the physician had no longer at his command the means of jugulating disease, he ceased to believe in its possibility. For the last thirty years we have heard much about the natural course of disease, but little and gradually less as to the physician's power of controlling it.

The inevitable reaction against this extreme has set in, however, and a new race of physicians is arising, who believe in and practice vigorous (because properly directed) intervention on the part of the physician. Effect follows cause; and this renaissance in therapeutics is based upon the introduction of a series of medicinal agents, as powerful as those of our ancestors and much more manageable. A small group of remedial agents has been found to exert, when given in absolute chemical purity, unvarying effects upon the mechanical conditions manifested in the circulation. With absolute certainty these remedies increase or decrease vascular tension. Close study of their effects in health and disease has led us to the belief that the cells of the animal organism display toward these remedies a certain selective action, whereby the spastic cells will take up from the circulating fluids those remedies which relax such spasm, while in the compensatory areas of circulatory relaxation the affected cells imbibe agents which restore them to normal tonicity; and that as both pathologic conditions coexist, each set of cells will absorb and utilize the remedial agents it needs, both of which are circulating in the blood at the same time.

The greater the experience which a physician has in the use of these remedies, the firmer is his conviction of the possibility of jugulating acute attacks. The unbelievers are found exclusively among those who alike refuse to believe in the possibility of jugulation and to put the methods by which it may be accomplished to trial.

We will now take up the question as applied to diseases due to microörganisms. As to animal parasites, such as the malarial plasmodia, there is no question; the entire profession has always sought and still seeks to abort these attacks by the destruction of the parasites. Nobody questions the possibility of this; but singularly enough, when it comes to dealing with parasites of vegetable nature the line is sharply drawn, and the assertion made that all such diseases must necessarily go through a regular course, which cannot be shortened by any therapeutic measure whatsoever.

It is not asserted, however, that these affections cannot be lengthened—in fact we know that they are prolonged in some instances, so that a pneumonia may end on the fifth, the seventh, or the ninth day, or not even then; while the writer has seen a typhoid fever, instead of stopping at the end of the classic three-weeks' period, run along until the patient only left his bed at the end of three months. If the course is variable in the one respect there seems to be no good reason why it should not vary in the other. Moreover, there is abundant evidence that it does vary. In the older works on practice, such as Pepper's, we find it stated that abortive cases of typhoid fever occur, from unknown constitutional causes; the therapeutic pessimism prevailing when these books were written refusing to credit this result to the therapeutics employed. A series of cases of typhoid fever treated by intestinal antiseptics at the Cook County Hospital showed that numerous cases ended before the twenty-first day, especially in children, in whom the problem of disinfecting the alimentary canal is less difficult than in adults.

Countless numbers of gonorrheal infections have been reported to the writer, in which the attack has been promptly aborted and the body completely rid of the invading cocci by complete saturation with calcium sulphide. This remedy has been widely employed in the entire range of infectious maladies, especially in France, with such results as have developed the broad claim that no known microörganism can exist alive in the body of a human being who is so saturated with calcium sulphide that its odor is exhaled with the perspiration. Up to the present all the evidence we have been able to collect concerning this statement has gone to confirm it. While we cannot as yet adopt it implicitly, we are still seeking unsuccessfully for exceptions to its universal application.

Quite recently one case was reported as such an exception. A physician was treating a patient for gonorrheal rheumatism, a malady every case of which that has come under the writer's observation for ten years has been completely cured by the use of calcium sulphide. In this case, however, the physician reported that he had been unable to secure saturation, even after administering calcium sulphide of the best quality obtainable in doses reaching forty-eight grains a day. He reported that under such doses the patient felt perfectly well, but his rheumatism was not cured. An examination of the blood, the prostatic secretions, etc., showed the absence of the gonococcus, and proved that the diagnosis was mistaken. One other case has come to my knowledge in which it has been impossible to saturate the patient, a phenomenon I am as yet unable to explain.

Another malady now attributed to coccal infection is erysipelas. From this disease considerable capital has been derived by the therapeutic nihilist, who claimed that the eruption spontaneously subsided after four days' endurance in the same place, and that to this subsidence was due the reputation which any remedy had obtained as a means of curing erysipelas. But take any case of sthenic, febrile erysipelas, and administer pilocarpine

enough to induce sweating, and you will see the eruption fade out in areas which have just been invaded within a few hours. You can if you like then discontinue the remedy, and you will see the erysipelas reappear; and by repeating and discontinuing the pilocarpine alternately you can satisfy yourself that you have in this remedy a means of perfectly controlling the disease.

We have therefore in simple inflammations, if there be such, in diseases due to animal parasites, and in those due to microörganisms of vegetable nature, remedies whose proper application is capable of jugulating the acute attacks. The possibility of accomplishing this in one such disease carries with it the possibility of doing the same thing in other similar affections, if we possess the means. Whether we do is another question. For myself, I firmly believe that remedies capable of accomplishing this, in every affection to which man is liable, are in existence; and if not known they await discovery, when men are sufficiently convinced of their possibility to make diligent search. Disbelief paralyzes enterprise. Nothing of value was ever yet elicited by it. It is only faith that moves mountains. Unbelief is death.

PNEUMOCOCCIC INFECTION IN RELATION TO HEMORRHAGE IN TUBERCULOSIS.

BY LAWRENCE F. FLICK, M.D., PHILADELPHIA.

One of the obstacles in the way of progress in the study of pneumonia has been the nomenclature used. The word pneumonia means inflammation of the lungs, and has been associated for so long a time with a symptom-complex of which inflammation and intense toxemia are the chief parts that it is difficult to connect the word with anything less striking and pronounced. It is hard to think of pneumonia in any other character than a malignant disease. In the light of what we know about the pneumococcus this long association of pneumonia with malignancy also makes it difficult to connect the pneumococcus with pneumonia. There is such a chasm to bridge over between the innocent condition in which the pneumococcus is present in the mouths of healthy people and the malignant disease which strikes down a friend in forty-eight hours that skepticism about the relationship between the pneumococcus and pneumonia precludes further investigation or inquiry with most minds. And yet the relationship in reality is not illogical. We merely have failed to recognize what lies in between. As with other diseases, so with pneumonia, there are forms grading from an innocent condition, in which there is neither toxemia nor inflammation, to a malignant disease in which these two symptoms overtop everything else. Unfortunately the word pneumonia does not readily lend itself to this wide gradation. For this reason I would suggest the word pneumococcosis for all those conditions in which there is a pneumococcus infection without open, frank inflammation of the lungs. The adoption of this word will make it much easier to follow and study the spread and devastation of the pneumococcus. I believe that we will find that the pneumococcus either alone or in association with other microörganisms produces many of the lesser ills from which mankind suffers, and that these lesser ills are connecting links between the severe malignant cases of pneumonia.

The work which we recently have done at the Henry Phipps Institute for the elucidation of the relationship between the pneumococcus

and hemoptysis in a measure bears this out. In between our mild cases of hemorrhage we have had malignant cases of pneumonia, two of which proved fatal. We also have had cases of mixed infection without physical signs of pneumonia in which we have found the pneumococcus; and in these cases we gradually have come to recognize the toxemia of pneumonia, by a careful analysis and comparison of the symptoms. When such cases have come to autopsy we have found the pneumonia, which could not be detected during life, usually in the form of a bronchopneumonia. These cases all run a higher temperature than belongs to tuberculosis; all have intense toxemia, which cannot be accounted for by the tuberculous involvement; and usually are in a fair condition of flesh. They run on to a fatal termination apparently without sufficient reason, and even at autopsy one wonders why they should have died with so little destruction of lung tissue as compared with people who actually die of tuberculosis. Death in these cases, moreover, is the typical death of pneumonia. The patient becomes more or less cyanosed, gasps for breath, and has a rapid, weak heart. The lungs become edematous, and the heart gradually loses its muscular tone until it fades into inactivity.

Some of the hemorrhage cases in which the pneumococcus was present in the expectorated blood well illustrated that condition for which the term pneumococcosis would be suitable. They were taken down suddenly with a hemorrhage from a condition of well-being, either with or without a chill, ran a slight temperature for a few days, then returned to their former condition of health, and all was over. In these mild cases no evil follows the attack as a rule. Sometimes, however, the hemorrhage was followed by fever which lasted a long time, with development of typical pneumonia, recognized by the physical signs. Sometimes the attack has been accompanied by pleuritic effusion, with symptoms of sepsis.

The hemorrhage in those cases in which the pneumococcus is present is not always a full hemorrhage. Frequently it is merely a blood-streaked sputum. We have found the pneumococcus sufficiently often in blood-streaked sputum to warrant us in recommending that it be looked for in all cases in which the slightest trace of blood appears in the sputum. The discovery of the pneumococcus in these cases may give us an inkling of what is coming some days before severe symptoms set in, and perhaps enable us to ward off the severity of the blow.

The practical lesson to be learned from our recent work is the isolation of all cases of pneumococcosis. Whenever there is blood-streaked sputum an examination should be made for pneumococci, and when a case of pneumococcosis occurs in an institution in which there are a number of cases of tuberculosis the sputum of all cases should be examined for pneumococci in order that all cases of pneumococcosis may be discovered and isolated. In future sanatoria will have to be provided with isolating pavilions for the isolation of cases upon admission, and for the isolation of any cases that may be infected while in the sanatoria. All new cases admitted into the sanatorium should be isolated for at least two weeks before being allowed to associate with the patients already in the sanatorium, and all cases which develop pneumococcosis in the sanatorium should be removed to an isolating pavilion separate and distinct from the entrance pavilion. Such a provision as this will be absolutely necessary for the best interests of patients who enter sanatoria.

SUDDEN DEATH IN EPILEPSY AND EPILEPTIC SELF-INFLICTED INJURIES.

BY W. F. HOWAT, M.D., HAMMOND, INDIANA.

Several rather unusual but exceedingly interesting forensic questions were raised in the recent Indiana case of State *vs.* Truman Beam, in which I was called by the defense as an expert.

Truman Beam, the defendant, was charged with the murder of Martha Lawrence, by strangulation. Martha Lawrence was found dead in bed at the Beam home on the morning of April 24, 1903. She was lying flat on her back, covered up. One of her legs was slightly drawn up. Her head was turned toward the right. Her face was somewhat discolored and swollen. Frothy mucus, mixed with blood, exuded from her nostrils. Some blood came from the ears (this, however, was in dispute and was not clearly established). The bedding beneath her was wet, as if from urination (at the second trial one witness testified that some bedding over her body was likewise wet). There were some marks and scratches on her neck. Drs. Loring and Carson, of Valparaiso, Ind., testified that there was a blue mark three or four inches long and two inches wide extending from about an inch below the lobe of the right ear, in an anterior direction. While the skin at this point was not broken, the doctors testified that there was a slight abrasion on the left side, near "Adam's apple." There were two or three places where the skin was entirely removed; these spots were about the size of a pea.

On the night of her death she slept up-stairs alone. Truman Beam and his father slept down-stairs. Mrs. Beam had died some time prior, and Martha acted as housekeeper. Truman's younger brother was not home that night. The defendant got up early April 24 and built the fire, as was his custom. He claims that he then called Martha, but receiving no response went to her room and found her dead. He then told his father. This was about 5.30 A.M.

Martha Lawrence was a strong, robust young woman, about 150 pounds in weight. She had never been married, but two years prior to her death had borne a child. For three or four years prior to her death she had, according to the evidence presented by the defense, some kind of "sinking spells or fits." She would frequently fall to the floor, and remain unconscious for a time varying in length from a few minutes to two hours. At times she would talk incoherently, would be unable to recognize any one, or would become ghastly pale. While as a rule she had the appearance of a dead person, occasionally she kicked around, attempted to pull her hair, and sometimes had to be held to prevent her doing herself injury. At the onset of these "spells" she breathed so heavily that she could be heard all over the room, but in a few moments the heavy breathing ceased, and it became difficult to determine whether she breathed at all. During the last week of her life she had two or three such attacks, which were described as being very severe. Medical aid had frequently been summoned for her, and the attending physician swore that she was an epileptic. He had, however, never seen her during a complete attack of grand mal.

As to motive, the prosecution in the opening statement alleged that Beam was jealous of the girl and killed her in a jealous rage. When the closing arguments were made they changed front, alleging that Beam was tired of her and wished to be rid of her, insinuating that he was the father of her child. At the second

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trial (which followed a disagreement of the jury) the possibility of this was absolutely disproven. The State then relied for motive upon the fact that at times Beam exhibited an ungovernable temper. The State claimed that the deceased died from strangulation, caused by external violence and pressure applied to her throat by the defendant.

The coroner and his associate based their opinion wholly upon the marks upon the neck and upon the pulmonary congestion found post mortem. They denied that she could have died from epilepsy, since an epileptic could not inflict the marks or bruises upon his or her person which they found upon the deceased. They claimed that the muscular contraction would prevent her from getting her hands to her throat. They also claimed that the brain and all other organs of the body were in a healthy condition, and that there was no evidence of disease in any portion of the body. This in their judgment was opposed to the theory of epilepsy. They had not, however, sought for a persistent thymus, nor had they carefully examined the blood-vessels nor compared their size on the two sides of the body. At the first autopsy no dissection of the neck was made, nor any examination of the larynx or trachea, nor any search for foreign bodies in the air-passages. The cutaneous surface of the neck was alone examined. About twenty days after death they exhumed the body and removed parts of both sides of the neck. It was claimed that these parts exhibited evidences of bruising, blood-clots beneath the skin extending entirely through the sterno-cleidomastoid. But there was no evidence of any injury to the larynx or trachea. At this time a search was made for foreign bodies, but none were found. The tissues removed at the second autopsy were not offered in evidence, nor was the defense permitted to examine them.

The first autopsy showed that at the time of death gastric digestion was going on. She was shown to have taken food about 9 P.M.

As expert for the defense I was asked if, in my opinion, the "sinking spells or fits" from which the deceased suffered were epileptic seizures. I answered that they were probably such seizures. Could an epileptic inflict scratches or other injuries on him or herself during any portion of the attack? I replied they could do so during the aura, leaving out of consideration the various injuries that might be sustained during the convulsive and postconvulsive stages. Might not the blue mark on the right side of the neck have been due to post-mortem lividity? I replied it could, since there was no testimony excluding this possibility. Might not this lividity have been aggravated in extent and intensity by the fact that the head was drawn to that side and a fold of soft tissue so produced at that point? to which I replied "Yes." Might not the convulsive movements on that side of the neck have been more severe than elsewhere? to which I replied "Yes." Are convulsive movements ever so violent and forcible as to cause muscular rupture? to which I replied "Yes." Do epileptics ever die suddenly? to which I replied "Very frequently." Do they ever die suddenly during an epileptic seizure? to which I replied "Yes." How may death be brought about suddenly in epileptic seizures? To which I answered:

(*a*) By exhaustion, as in the status epilepticus—which exhaustion may be produced by a series of convulsions, or by one convulsion if it be sufficiently severe.

(*b*) Possibly by paralysis of the respiratory centers, due to severe shock.

(*c*) By tonic spasm of respiratory muscles, in which class may be included Hilton Fagge's cases of "spasm of the glottis."

(*d*) By sudden cardiac nerve strain, dilatation, or rupture.

(*e*) By asphyxia from foreign bodies (as food) or suffocation.

(*f*) By accidental violence sustained during the seizure.

Would cases dying suddenly from chronic spasm of the respiratory muscles show post-mortem signs of asphyxiation? to which I replied "Yes." Could you exclude epilepsy as a possible or probable cause of death in the case of Martha Lawrence? to which I replied "No." Does the evidence justify the opinion that the death of Martha Lawrence was due to strangulation by external violence? to which I replied "No." Was the examination of the body as conducted sufficiently careful and exact to exclude other causes of death than that alleged by the State? to which I replied "No." What was the value of the second autopsy in establishing the condition of the muscles of the neck and the state of the laryngeal and tracheal tissue at the time of death? I said that in my judgment the second examination was valueless.

The accused was acquitted on the second trial, since it was obvious that the State's evidence did not fulfil all legal requirements. It did not explain all the facts, nor did it exclude other explanations. On the principle that guilt must be proven beyond a reasonable doubt the jury was naturally forced to acquit.

Physiological Action of Adrenalin.—

T. G. Davis, in discussing the recent literature on the suprarenal gland before the Los Angeles County Medical Association (*Southern California Practitioner,* February, 1906) says that adrenalin acts on the muscle cells directly and not through the nervous system. It increases muscular tone and consequently vasomotor constriction, shown principally in the splanchnic area, which increases the blood-pressure throughout the body. Its action on the vessels of the skin is slight, and it is not marked on the vessels of the brain and lungs. The constriction of the renal vessels is transitory, hence the flow of urine is successively diminished and increased. The rise of blood-pressure, while usually great, is of short duration. The rise of blood-pressure stimulates the vasomotor center; the heart is quickened, and then slowed. The pulmonary circulation is engorged by large doses of adrenalin, and it lessens the rate of absorption and elimination. It acts as a local hemostatic and is useful in peripheral hemorrhage, and may be of value in hemorrhage from the stomach, but it is of little value in hemorrhage from the lungs, liver, or intestines. It has been advised in uterine fibroma to lessen hemorrhage, and good results have been reported from its use in inoperable carcinoma. It causes minute extravasations of blood, which are replaced by inflammatory tissue and followed by contraction. The leading therapeutic indications are as a local hemostatic and to raise blood-pressure. Such a powerful agent should be used only when hypotension exists, and it should be used cautiously in cases of atheroma.

Sodic Nitrite in the Lightning Pains of Tabes.—

Raymond (*Journal des Praticiens,* December, 1905) says that the lightning pains of tabes call for the administration of large doses of mercury. The pains may indicate a gross tertiary lesion which will yield to the specific medication. In case the mercury is not followed by improvement resort should be had to the hypodermic injection of a one-per-cent solution of nitrite of sodium. Fifteen minims should be given every day for ten days, followed by a rest of ten days. If the pains persist a similar course should be given, using a two-per-cent solution.

BOOK REVIEWS.

PATHOGENIC MICROÖRGANISMS. Including Bacteria and Protozoa. A Practical Manual for Students, Physicians, and Health Officers. By William Hallock Park, M.D., assisted by Anna M. Williams, M.D. Second Edition, Enlarged and Thoroughly Revised, with 165 Engravings and 4 Full-page Plates. Lea Brothers & Company, New York and Philadelphia, 1905. Price $3.75.

In looking over the pages of this work there is little to suggest the first edition, which made its appearance in 1899 under the title "Bacteriology in Medicine and Surgery." The title, the size of the volume, the general appearance, the revised and rewritten matter, the increased scope of the work, and the introduction of large numbers of new illustrations combine to make it a different book.

It is declared to be a "Practical Manual for Students, Physicians, and Health Officers," and as such we have critically examined its pages. As a work or treatise upon bacteriology it is in many points unexcelled, but as a practical manual for students it has some defects. The writing is obviously from a master-hand—that is, from a master of bacteriology; and the chapters upon the various diseases and their specific microörganisms contain not only all that one should know, but very much more than any but a bacteriologist need desire to know. This is one of the excellences of the work, but unfortunately the story of bacteriology is not told in such a logical, entertaining, and clear style as to make it other than tedious reading. It is, of course, eminently desirable that the facts to be presented shall be gathered together in their entirety, and presented systematically and yet entertainingly; and we regret to say that we find it difficult to read many pages in this work.

The stamp of authority is well distributed throughout the book, the superior excellence of the author's well known investigations, to many of which reference is made, enabling him to speak authoritatively upon important subjects in bacteriology and sanitary science. The text is replete with the results of these investigations, so that much of it is in the desired "original" style.

The excellence of the work is such that one is reluctant to point out what seem to be imperfections, and it is with hesitation that we call attention to the paucity of references to the literature of the subject. It is true that the authors quote voluminously from the literature with careful mention of many names, but it is remarkable that in so few cases have they made it a practice to refer the reader to the original writings of those whose names they quote. Page after page contains no such references, whereas in other places a half-dozen or more appear in a foot-note. This is a serious loss to those who desire to extend their reading beyond the present writing. Of what importance is it to know that Ehrlich has done much in enabling us to explain immunity if we are not given the means to refer to the original papers upon the subject? Chapter 15, which deals with the nature of the protective defenses of the body and their manner of action—Ehrlich's "side-chain theory"—has not a single reference to the literature of immunity, than which scarcely any at the present time is more voluminous and more interesting, or from the standpoint of original investigating more inspiring.

In our judgment the work will prove most useful to those who already have a fair acquaintance with the subjects of which it treats.

TEXT-BOOK OF PSYCHIATRY. By L. Bianchi, M.D. Authorized Translation from the Italian by J. H. MacDonald, M.B. New York: William Wood & Co., 1906.

The first section of the Italian edition of the present work was reviewed some years ago in MEDICINE. The present translation, which is excellently done, fully justifies the favorable opinion then expressed. The work opens with interesting discussions of cerebral anatomo-physiology in its pathologic relations. The classification adopted is modified from the classification suggested at the Italian alienistic congress at Ancona. It is as follows: (1) Congenital psychoses: Arrests and deviations of psychic development (phrenasthenia; moral insanity; psychopathia sexualis). (2) Simple acute psychoses (mania, melancholia, amentia, and sensory psychosis). (3) Chronic psychoses, primary consecutive (paranoia, periodic psychoses, dementia: (*a*) senile, (*b*) secondary). (4) Paralytic psychoses (classic paralytic dementia, luetic dementia, alcoholic dementia, encephalomalacic dementia). (5) Psychoses from neuroses (epileptic psychoses, hysteric psychoses, neurasthenic psychoses, choreic psychoses). (6) Toxic psychoses (pellagrous psychosis, alcoholic psychosis, morphinic psychosis, cocainic, etc., psychosis). (7) Infective psychoses (post-influenzal, enteric, etc., psychosis, syphilitic psychosis, acute delirium). There are many decidedly valid objections to this classification and to its terminology. Psychopathia sexualis may be an acquired state and is not by itself a psychosis in a morbid sense. Paranoia is frequently the mental phase of an arrest of development. Amentia has been

used to designate idiocy as well as the confusional states here intended. Paralytic dementia has been used to designate post-apoplectic mental states as well as paretic dementia. Acute delirium does not belong in the infective group since its alleged bacterial origin has failed of demonstration under Koch's law, and it is notoriously often due to moral shocks. It is to be regretted that the term acute paranoia should be applied to the conditions to which the Germans apply the term "verwirrheit," and many of the English-speaking alienists call primary confusional insanity. There is a wide gap between the period of transformation of true paranoia where consecutive hallucinations occur and primary confusional insanity where the hallucinations are primary. This effort to establish identity of two widely separated states, first attempted from superficial analogy by Rosenbach, can lead to nothing but confusion. The clinical studies are models of lucidity. The book is excellently issued by the publishers.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of Gustavus P. Head. Vol. I, General Medicine, edited by Frank Billings, M.S., M.D., and J. H. Salisbury, A.M., M.D. The Year Book Publishers, 1906.

The editor in the general preface to the current series of volumes makes some comment on the general tendency of periodical literature. He notes that there is a steady advance from year to year in the quality of the output, and refers to the fact that this advance puts a severe test each year on the reviewer. He says: "So great is the mass of really valuable literature appearing that the work of the department editors becomes steadily more onerous. The articles not worth quoting are easily thrown out; the real work is in selecting from the good that which should represent the best thought of the year. Readers are sometimes surprised to find that an excellent article which they have read during the year is not quoted in these books. In practically every such case the same ground is in the judgment of the department editor better covered by another article which he chooses. It is not the province of this series to quote from every good article of the year, but to so choose from the good material that no valuable thought of the year shall fail of presentation. Much that is presented as new in the journals is on its face useless and impracticable. Many old practices that have been questioned have by renewed observations been established on a firmer basis."

The two volumes which will comprise the review on general medicine in this series under the charge of Billings and Salisbury give annually a most excellent review of the literature of general medicine. In this volume the diseases of the respiratory, circulatory, and blood-making organs are reviewed, together with the general infectious diseases, those of the ductless glands, the rheumatic affections, and diseases of the kidneys. As an index of the attention which has been given to tuberculosis in its various manifestations, 110 pages are devoted to that topic.

ANATOMY, DESCRIPTIVE AND SURGICAL. By Henry Gray, F.R.S. Edited by T. Pickering Pick, F.R.C.S., and Robert Howden, M.A., M.D., C.M. Revised and Edited with Additions by John Chalmers Da Costa. Lea Bros. & Co., Philadelphia and New York, 1905. Price $6.00.

The medical man in a court of law is often asked his opinion of certain "authorities," or he is asked if a particular writer is an authority. If he is wise he will qualify his answers by the statement that medicine has few authorities. It would be safe to admit that the standard dictionaries and Gray's Anatomy are authorities in the sense in which this word is commonly used in law courts. Gray's Anatomy has become an authority because it is the joint product of a large number of workers extending over many years. The errors and misstatements which were very frequent twenty-five years ago have been gradually eliminated, until the work can now be accepted as a standard. The present edition has grown to a volume of 1600 pages, but the characteristics of Gray's Anatomy of a quarter of a century ago are still retained. Any middle-aged practitioner who used this book in his student days —and it can be safely stated that comparatively few of them did not use it—would recognize the work by glancing at a few of the pages, even if the title-page could not be seen. Many of the old illustrations have been reproduced, but a large number of new ones have been added, and those of the old ones which it was necessary to change have been altered. Of 1132 illustrations in this edition 500 are new. A large number of new engravings are in colors. In the main the illustrations are very well done; a few of them could be improved by new plates.

That Gray's Anatomy has been kept the leading work on anatomy in the English language has been due to the untiring efforts of numerous editors and to the criticisms and intelligent suggestions of the many teachers who have employed Gray's Anatomy as a text-book. While numerous and creditable works on anatomy have appeared from time to time, none have supplanted Gray. Owing to the peculiar didactic character of the work it has always remained the best volume for teaching and demonstration. In this last edition the current nomenclature of English-speaking countries has been retained, followed in parentheses by the international nomenclature in Latin. This system will facilitate the much-to-be-desired adoption of the new nomenclature. The accuracy and simplicity of the

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new terminology is unquestioned, and while it cannot be abruptly adopted the use of it in Gray's Anatomy will tend to familiarize the present generation of medical students with its use.

LECTURES ON AUTOINTOXICATION IN DISEASE. By C. Bouchard, M.D. Translated with a preface and new chapters by Thomas Oliver, M.D. Philadelphia: F. A. Davis Company, 1906.

This is the second edition of a work which twelve years ago attracted considerable attention as a revival of the old theory of self-poisoning by endogenous products called rheums, still preserved in the term rheumatism. The conception of autointoxication of both Dr. Oliver and Dr. Bouchard is rather broader than the usual conception. The intestinal results of bacterial action resorbed are considered as partly an autointoxication. The general discussion of the subject is somewhat broader than might be deemed from certain narrow views expressed in the discussion of indicanuria. The discussion of the relations of autointoxication to the mental states ignores the exceedingly valuable researches of Coriat on the acid states in stupor and mental depression. The recommendation of iodoform and naphthalin in intestinal antisepsis ignores the untoward effects of these drugs. While the book is of considerable value it should have received much more rigid revision to bring it up to date. It is well issued by the publishers.

MAN AND HIS POISONS. By Albert Abrams, A.M., M.D., F.R.M.S. New York: E. B. Treat & Co., 1906. Price $1.50.

This work, like all of the author's writings, is exceedingly suggestive. The subject is always approached from an original view-point. In some respects it is an elaboration of the views that the writer expressed in his work on splanchnic neurasthenia. While the whole subject of autointoxication may be said to be in its infancy and the data upon which it is based is by no means accurate, yet it is evident that not a few of the most distressing functional conditions have their origin in a perverted metabolism or the direct absorption of poisons from the alimentary tract. In his first chapter he discusses the scientific conceptions of life as modified by recent investigations, such as those of Loeb. The relations of poisons to fatigue, the emotions, and to the various manifestations of hysteria are discussed. The treatment of autointoxication is quite fully gone into, especially the physical methods, such as electricity, light, baths, and massage.

The work contains much that is of value, but is on the whole rather diffusely written, the author not always sticking to his text. It is a suggestive volume, and will well repay the perusal of the man in active practice.

MANUAL OF PATHOLOGY. Including Bacteriology, the Technique of Post-mortems, and Methods of Pathologic Research. By W. M. L. Coplin, M.D. Fourth Edition, Rewritten and Enlarged. With 495 Illustrations and Ten Colored Plates. Philadelphia: P. Blakiston's Son & Company, 1905. Price $4.00.

A book reaching its fourth edition is a sufficient indication that it fills some want of the medical student or practitioner. Books that fail to fulfil this need are doomed to die before the first edition is exhausted. The work before us made its first appearance during the winter of 1894-1895 as a collection of abstracts of lectures, and has gradually expanded into the present volume of 948 pages. The author states that during this period of expansion "the object of the book has not been changed, and that the present edition, although greatly enlarged, remains exactly what the author intended the previous editions to be, namely, not a treatise or book of reference, but, as its title indicates, a manual that the author hopes may be useful in the laboratory and post-mortem room and in clinical diagnosis by the aid of the microscope."

The scope of the book is ambitious. It includes post-mortem and microscopic technique, bacteriology, and clinical pathology, and also covers the entire field of general and special pathology; yet there seem to be few if any important omissions. Not infrequently the writing lacks conciseness and clearness, so that the student after the perusal of a long paragraph is obliged to frame a definition for himself. This is shown in the introductory paragraph to Part II, upon General Pathology, which consists of fourteen lines, but could probably be condensed to five lines with great advantage. Although the author speaks highly of the illustrations and refers to their importance, they are not of the high class seen in most recent American publications.

But these are minor matters, and as we have perused its pages we have found the work to be a reliable and satisfactory guide, from which a thorough acquaintance with the subjects treated may be had; and it is with feelings of congratulation that we note the industry and carefulness with which the author has improved upon his former work.

MODERN MATERIA MEDICA AND THERAPEUTICS. By A. A. Stevens, A.M., M.D. Fourth Edition. W. B. Saunders & Co., Philadelphia and London. Price $3.50.

Stevens's work on Materia Medica and Therapeutics has been revised and reprinted to bring it in accordance with the last revision of the Pharmacopœia. The first edition was issued in 1894. The year following it was thoroughly revised. In May, 1903, a new enlarged edition was issued, and it was again revised the following year. Lastly, we have the fourth edition, to which

much new matter has been added, as well as the older part having been thoroughly revised. New articles have been added dealing with scopolamine, ethyl chloride, theocin, veronal, and radium. There has been added a section on radiotherapy. Attention is called to some of the more striking changes in the Pharmacopœia. The tincture of aconite has been reduced in strength from 35 to 10 per cent, and the tincture of veratrum from 40 to 10 per cent. The tinctures of strophanthus and cantharides have each been increased in strength from 5 to 10 per cent. The tincture of nux vomica now contains 0.1 per cent instead of 0.3 per cent of strychnine. Blue ointment and mercurial ointment are no longer synonymous. The former now contains about 33.5 per cent of metallic mercury, while mercurial ointment contains about 50 per cent, which was formerly the strength of blue ointment. The work is divided into two parts—the first dealing with materia medica, and the second with applied therapeutics.

Wild Medicinal Plants of the United States. By Alice Henkel. United States Department of Agriculture, American Plant Industry, Bulletin No. 89. Washington: Government Printing Office, January, 1906.

The writer has performed a valuable service for medical men and pharmacists in preparing a list of the wild medicinal plants which have a commercial value—that is, such as are usually mentioned in the trade lists of drug dealers and which are commonly used as medicines or in a domestic way. Both official and non-official drugs are included in this list. Each drug is described under its botanical name, with a brief description of the plant, which in some instances is sufficiently full to admit of its being recognized. The greatest value of the Bulletin will be found in the long list of common names together with their scientific equivalents.

A Laboratory Manual of Physiological Chemistry. By Elbert W. Rockwood, M.D., Ph.D. Second Edition. F. A. Davis Co., Philadelphia, 1906. Price $1.00.

In the preface to the last edition the writer says that in no department of biology have the advances of recent years been more marked than in physiological chemistry. The subject has always been regarded as important in the study of the vital processes. Its value is being emphasized as a fundamental in medical education. The work was originally prepared, as its title indicates, as a laboratory manual, the author being firmly convinced of the superiority of the laboratory method of instruction. He believes that it is only by practical work that the student can become familiar with the physiological changes in the animal body. In all about 425 tests are described. the simpler and more elementary ones being stated in large type, while the rarer and those intended for more advanced students are given in smaller type. The practical and simple tests are used, the pathological material for which can be readily obtained from any hospital, and the albumin, blood, bile, and other products are readily secured from the slaughter-house. The actual expense for tests is small, and the amount of knowledge the student may acquire in this way is very considerable. This small work will be found for beginners to be more practical than some of the larger books.

International Clinics. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by A. O. J. Kelly, A.M., M.D. Vol. IV, 15th Series, 1906. The J. B. Lippincott Co. Price $2.00.

The current volume of International Clinics is a work containing 312 pages. It is splendidly illustrated with a number of half-tone plates and one colored lithograph illustrating a localized psoriasis. Each volume of this series has an adequate index, and at the close of the series, which includes the four numbers for the year, there is a general index of the four volumes. This adds to the value of the series as a whole, which contains an excellent epitome of the advance of medical science. The current volume has five articles on treatment, six on medicine, seven on surgery, four on obstetrics, one on ophthalmology, and two on pathology. The contributors to the current volume include Benedict, Craig, Deaver, Dyce Duckworth, Simon, Thayer, and Wilcox.

Practical Massage in Twenty Lessons. By Hartvig Nissen. Philadelphia: F. A. Davis Co.

The author published his first book on Swedish movements and massage treatment in May, 1899. It was prepared largely from a theoretical standpoint, and based upon the teaching of others. Since then his experience has broadened. In addition he has been a teacher of practical massage in the Harvard Medical School. The first ten lessons are taken up with a description of active and passive movements, kneading, slapping, and frictions. The eleventh lesson deals with general massage, and the remainder of the book with the use of massage in different affections. The work is a description of the practical methods of massage and Swedish movements in the treatment of various disorders. It will be useful to the general practitioner who wishes to have a brief and accurate description of these methods.

ABSTRACTS.

THERAPEUTICS.

The Treatment of Gonorrheal Rheumatism by an Antigonococcus Serum.—

ROGERS, J. *Journal of the American Medical Association,* vol. xlvi, No. 4, p. 263, Jan. 27, 1906.

TORREY, J. C. *Ibid.,* p. 261.

Cases of gonorrheal arthritis can be roughly grouped into three classes—those which are mild and recover quickly, those which are severe and run a prolonged course, and those few which continue indefinitely. From what is known of other infectious diseases it is evident that the prolonged cases of this infection must lack the antibodies which naturally exist or are produced in the vast majority of individuals. If these antibodies could be provided artificially, recovery could at least be accelerated; and with the specific object of thus benefiting one of the patients the writer proposed the scheme to Dr. John Torrey, who coöperated in the production of an antigonococcus serum. The paper contains a description of the localization and pathogenesis of the gonococcus, and contains the histories of eight cases that have been treated with Torrey's antigonococcus serum, in six of which very marked improvement and subsequent cure are attributed to the serum, and in two of which some improvement followed its use.

Although past experience suggested that there was very slight chance of success, Torrey prepared a serum by the use of a culture isolated from an acute case of gonorrhea in a male. The gonococci in the exudate obtained from this patient were numerous, and were practically enclosed in the leucocytes. Smears from the discharge were made upon Petri dishes containing ascitic agar. After twenty-four hours' incubation an almost pure culture of small transparent colonies appeared. These were composed of small diplococci in every respect identical in morphology, staining, and cultural features with the gonococci. They grew upon agar with ascitic fluid, the age of the culture being from thirty to forty days.

In order to secure a rich culture for purposes of inoculation the best medium was found to be a mixture of rich ascitic fluid and slightly acid beef infusion peptone broth in equal parts. Rabbits were used exclusively for the production of the serum. They were inoculated with 10 cubic centimeters of an entire culture at intervals of five or six days, the best effects resulting from the use of cultures from six to fifteen days old. The inoculations were always made intraperitoneally. The rabbits were bled for the first time after they had received six inoculations. The most economical method of bleeding is from the ear, which is previously shaved, then washed with a germicide, and after that with normal saline solution. After the animals show signs of becoming hypersensitive the bleeding is done from the carotid. Large rabbits should yield a total of from 70 to 90 cubic centimeters of serum. It is interesting to note that serum obtained from the later bleedings is more potent. Some rabbits produce a better serum than others. The serum loses little if any of its power after remaining in the ice-box for from one to two months. Although Torrey found no decided increase in the amount of toxin in his cultures when he experimented along the lines of de Christmas, he is able to confirm his assertion that it is possible to obtain an antitoxin for the toxin of the gonococcus.

The quality of the serum may be estimated by experiments on guinea-pigs. When these

animals receive 3 cubic centimeters of toxin the temperature drops about five degrees in the course of an hour, and at the end of three hours the animal may be dead. If, however, the animals receive 1 or 2 cubic centimeters of the antitoxic serum they show but a slight drop in the temperature, or no signs of intoxication at all, according to the size of the dose. The details of these experiments are to be published in subsequent papers.

The use of the serum is based upon the fact that in chronic gonorrhea in man there are comparatively few gonococci, but active immunity toward the gonococcus is never developed in man. Torrey supposes that the rabbit serum supplies enough of the immune bodies to assist the mechanism of the human body to destroy the cocci. The serum has also been found to contain agglutinins and precipitins for the gonococcus.

The Treatment of Heart Failure in Diphtheria.—BOLTON, C. *Lancet,* vol. clxx, No. 5 of vol. i, p. 282, Feb. 3, 1906.

Formerly the treatment of diphtheria was directed solely against the local lesion, but the modern conception of the disease regards it as a systemic intoxication which cannot be prevented by a direct treatment of the local lesion. The latter is alone dangerous when it mechanically obstructs the larynx. The poison directly attacks nervous and muscular tissues; in the acute stage of diphtheric toxemia acute degenerative changes occur in the nucleus of the vagus and there is fatty degeneration of the muscular fibers of the heart. The muscular power of the heart is lowered and its regulative method is interfered with. A large amount of the poison may suddenly overwhelm the heart and nervous system, but the later changes do not cause death unless there is some strain which the heart is unprepared to meet. The majority of patients if they survive the acute stage show some signs of heart failure, such as irregular action or dilatation. In treating the heart failure antitoxin is indicated, but there are certain auxiliary measures which are necessary. To prevent heart failure the antitoxin should be administered at the earliest possible moment, as in this way the toxin is neutralized. In administering antitoxin from 4000 to 6000 units should be the minimum dose for an ordinary case. In the more severe cases from 12,000 to 24,000 units should be given at once, and if on the following day there is no improvement in the local conditions the injection should be repeated. There is no danger in the antitoxin, and such complications as rashes, joint pains, etc., are quite as likely to follow small injections as large ones. Besides the severity of the case as a guide to the dosage of antitoxin, the time at which it comes under treatment is of importance, a larger dose being necessary on the third or fourth day than is necessary on the first or second day.

Next to the administration of antitoxin is rest, both physical and mental. In the acute stage of the disease sudden death may occur at any time from the strain of vomiting or rising suddenly in bed. If the acute stage is survived and the patient is left with signs of heart failure, due to changes not in themselves sufficient to kill, strain may determine a sudden death. If there are no signs of heart failure the strain of getting up too early in the progress of the disease often initiates them, thus evidencing the latent heart weakness. Rest should be insisted upon after the acute stage has passed, as the patients naturally remain in bed when acutely ill. In fatal cases the first signs of heart failure come usually about the end of the first week, and death generally occurs within the first fourteen days. The signs are generally irregularity and weakness of the pulse, together with undue rapidity or slowing. A small, irregular pulse is of bad prognostic import. The first sound of the heart is

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short and feeble and the pulmonary second sound accentuated, the impulse being diffuse and slapping. When these signs are present the patient should be kept in a recumbent position with the head low and be disturbed as little as possible. Vomiting is especially dangerous, and great care must be exercised in administering food. Patients should be kept in bed three weeks from the onset of diphtheria. If at the end of that period there is no irregularity of the pulse and no signs of dilatation, they may begin to sit up, and at the end of the fourth week be allowed to walk. If decided signs of dilatation are present and there is an irregularity of the pulse, the patient may have to be kept in bed for weeks or months. Rest should be continued until the symptoms have disappeared, or after three months if they still persist the patient may be allowed to sit up and gradually regain his old habits. As a rule drugs are of little value in the treatment of cardiac complications of diphtheria.

The Bier Treatment by Hyperemia.—

BREUER, M. *Medical Record,* vol. lxix, No. 8, p. 290, Feb. 24, 1906.

A Rapid Cure of Eczema of Face and Head.—

RICHTER, G. *St. Louis Medical Review,* vol. liii, No. 8, p. 142, Feb. 24, 1906.

Bier has unearthed the long buried doctrines of the value of hyperemia in disease. He says it is nature's own remedy. He has employed two methods of producing hyperemia: active hyperemia by hot air apparatus, and passive hyperemia by a rubber bandage restricting the return circulation. A mixed form is produced by a large suction apparatus. A striking effect produced by Bier's method is the relief of pain. In general the cases in which there is bacterial invasion are better treated by passive and the non-bacterial affections by active hyperemia. Tuberculous joints should be treated by the rubber bandage applied snugly for one hour daily. This hyperemia to be of value must cause some swelling of the limb, but edema should not be produced nor a blue discoloration. Pain or paresthesia, or the appearance of bright-red spots, also a coldness of the limb, point to an excessive dosage. The arterial pulsation must not be stopped. It is not necessary to apply the bandage directly above the affected joint. Where the wrist is involved the band may be applied to the upper arm. In opening a cold abscess there need be no fear of a mixed infection if this method is used after the incision. Bier has used this method in a great variety of joint affections, septic wounds, phlegmons, lymphangitis, etc. The weak points of the remedy in acute inflammations are the injury which may be produced by an overdose and its futility if administered in small doses. Experience should be acquired in subacute cases and in the gonorrheal and pyemic forms of arthritis. In gonorrheal arthritis this method is always specific. There is early relief of the pains and a restoration of motion. In these cases a prolonged stasis is necessary with profuse edema. The writer's paper particularly deals with the Bier method as carried out at Bonn, but he has employed it in a considerable number of cases. One of these was a boy whose illness began three weeks before with what appeared to be a follicular tonsillitis. When seen the temperature was 101°, and there was enlarged left tonsil and a large swelling back of the ear. A small pocket of pus in the left tonsil was opened. Bier's neck rubber band was applied and kept on for twenty-one hours. Within twenty minutes after its application there was some relief, and after several hours the head could be moved without pain. On the second day the bandage was applied tighter, and an edema appeared on both sides of the face. On the second day the swelling behind the ear had extended, and on the fifth day it was opened by a small incision, no drainage being used. The stasis was then em-

ployed and kept up for twenty-four hours, after which nothing was required but a change of the dressings.

Richter's case of eczema of the face and head was seen early in the disease, when there were many fresh and a few older papules and crusts on the forehead. A salicylic acid salve was prescribed, but the trouble continued to spread, finally involving the chin. Next Hebra's salve was used, which was followed by a little improvement. Later a boric salve was used. After nearly three weeks' treatment little progress had been made, the improvement in one place being counterbalanced by fresh attacks in others. The face was then covered with plain vaselin and an elastic rubber bandage placed around the throat. It was composed of half-inch silk-woven rubber, such as is commonly employed for garters, and was mounted with a self-locking device. It was applied so as to cause a slight congestion of the face. At the end of twelve hours it had caused a decided edema of the eyelids. This was followed by a prompt cessation of the itching. The rubber band was applied every day for about twenty hours, and was left off for four hours to permit the edema to subside. At the end of ten days the eczema had practically disappeared.

The Treatment of Psoriasis.—

GOTTHEIL, W. S. *International Clinics,* vol. iv, 15th series, p. 1, 1906.

The diagnosis of psoriasis presents few difficulties. Next to acne and eczema it is the most frequent of skin lesions, and of necessity its treatment must be largely in the hands of the general practitioner. The text-books give many remedies, but as a rule do not lay down the general rules which should govern the treatment of these cases. In treating the disease it should be recognized that it cannot be radically cured. For a time the efflorescence may disappear, but there is always a tendency to recurrence. From the standpoint of treatment the patients naturally fall into two classes: those in which there is some bodily disease, and those in which the patients are apparently in robust health. In the former it is necessary to treat the associated conditions. In some patients mental worry and nervous strain are important elements in the development of the disease. These must be given rest and freedom from household cares or other sources of worry. In the internal treatment of these cases arsenic alone is useful, and it is best given in the form of hypodermic injections. It is most conveniently given in a one-per-cent solution, which can be readily sterilized. An injection is given once daily, beginning with three drops, and increasing from one to three drops daily until the symptoms of saturation are reached. If the treatment is given every other day the results are practically the same, though more time is taken.

When it is inconvenient to give the hypodermic injections, a convenient way is to administer the arsenious acid in the form of Asiatic pills, composed of arsenious acid 1 grain, powdered black pepper 30 grains, gum acacia and water sufficient to make 100 pills. This prescription is commonly given after the hypodermic medication is suspended, when the patient's skin lesions have disappeared. Local applications are of the utmost importance, and failure frequently results from their improper selection or inefficient use. As a necessary preliminary all scales must be removed and the skin thoroughly cleansed. This is accomplished by prolonged soaking in hot water with a free use of an alkaline soap, preferably the ordinary green soap or its tincture. Ether should be used to remove the fat. One cleansing may suffice, or the process may have to be repeated two or three times during the first twenty-four hours. As a local application tar is one of the oldest and most reliable. It is quite as val-

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uable as chrysarobin. It should be used in the form of purified birch tar. It can be applied pure or diluted with various preparations of olive oil, or made up with vaselin or alcohol, or in the form of a paint in flexible collodion. Chrysarobin is an effective application, which should be used in an ointment containing not more than three to five per cent at the beginning. It cannot be employed on the head or face. Pyrogallol is less effective than chrysarobin and is almost as disagreeable as tar. Like the latter it must be used with caution when applied to extensive areas. Ammoniated mercury can be used in the form of the official ointment, but it has less effect than the other remedies. It should be used where the lesions are on the face.

Adrenalin in Diseases of the Skin.—

RAVOGLI, A. *Lancet-Clinic,* vol. lvi, No. 7, p. 182, Feb. 17, 1906.

Adrenalin applied to the healthy epidermis has no effect, as there is no absorption. When the surface is excoriated or there are abrasions the skin around the excoriation becomes white in small patches, which gradually coalesce, forming large white surfaces. The action of the adrenalin is not limited to the blood-vessels alone, but it contracts the non-striated muscles of the skin. Its effects are noted within one or two minutes after the application, and they remain from one to three hours. Under the influence of the adrenalin the circulation is diminished, and there is no secondary hyperemia such as there is after the use of an ethyl chloride spray. In cases of rosacea and vascular nevi, adrenalin may be employed after scarifying the surface. Adrenalin has been employed in burns of the second degree in the form of compresses. A burn treated in this way becomes pale and does not form blisters. In acute dermatitis without oozing or blisters, painting with a solution of adrenalin relieves the itching and the burning, leaving only a slight feeling of distention. Adrenalin has been found useful in urticaria employing the catabolic action of the electric current. A similar method makes it useful in acute edema and in dermatitis herpetiformis. Adrenalin is a useful application in redness and pruritus of the vagina.

Baum uses adrenalin solution in the treatment of rosacea, introducing it into the skin through scratches of the epidermis made by rubbing it with sandpaper. He claims that in this way the blood-vessels are made more distinct and are more easily severed. The writer's method is to wash the parts with a two-per-cent carbolic acid solution and then spray them with ethyl chloride, after which the vessels are cut through. The blood is allowed to flow for a while, after which the surface is washed with an antiseptic solution and covered for five minutes with a piece of lint saturated with adrenalin. The surface is rendered anemic, and for a while there are no signs of rosacea, after which there is a return of the redness, but not to the same degree. The use of adrenalin has abbreviated the tedious treatment of this affection. In two cases of rhinophyma deep incisions were made into the hypertrophic skin, after which a drop of the adrenalin solution was injected into the deeper tissues. In this way the hypertrophied skin was lessened and the redness and congestion improved.

Treatment of Aneurism by Direct Gradual Arterial Closure.—

STRATTON, R. T. *Journal of the American Medical Association,* vol. xlvi, No. 10, p. 704, March 10, 1906.

Active clot formation is what occurs when a spontaneous cure of an aneurism takes place. It is the imitation of nature's method that gives the best results in treatment. A case is reported of aortic aneurism treated by constriction applied above the sac and gradually tightened. The patient did well for nearly two days, but then rapidly failed, with sensory and motor

paralysis of the lower limbs. Death took place on the second day after the operation. The autopsy showed that the constriction had been applied above the celiac axis. Death was attributed to the inhibition of the abdominal viscera due to the withdrawal of the blood supply. There was no perceptible injury of the vessel at the point of constriction, and the sac was fairly well filled with a stratified clot of the active type. The results in this case justify the belief that the method is in the main sound, as the aorta tolerated this form of interference, and the results showed a close imitation of nature's method of dealing with an aneurism. The chief field of usefulness will be found in cases of aneurism of the abdominal aorta where ligation is almost necessarily fatal, and other methods are either impractical or still more dangerous. The advantage of gradual occlusion over ligation in cases in which arterial branches supplying vital organs arise from the sac is obvious.

Thiosinamine in the Treatment of Tinnitus Aurium.—

McCULLAGH, S. *Medical News,* vol. lxxxvii, No. 27, p. 1257, Dec. 30, 1905.

The claim is made that thiosinamine has a distinct and selective action on sclerotic processes. It is this physiological action which gives it its value in the treatment of tinnitus, one of the most obstinate and distressing of symptoms. The drug was first used by von Hebra in 1892 for lupus. It is made by mixing 2 parts of oil of black mustard, 1 part of absolute alcohol, and 7 parts of ammonia water. This is warmed for a few hours on a water-bath at a temperature of 104°, and then evaporated to dryness. On cooling, glistening white crystals of thiosinamine are deposited. It is sparingly soluble in cold water, soluble in two parts of warm water, and freely so in alcohol and ether. Many authorities use the drug hypodermically, but this is not necessary. It can be given by the mouth in a 10- to 15-per-cent solution. The drug has little or no constitutional effect. After its administration there is a primary and later a secondary leucocytosis. The drug is an active alterative. It has been used in a number of cases of sclerosis of the middle ear, sometimes six months having elapsed before permanent benefit was obtained. As the drug acts on the connective tissue it is not to be expected that its exhibition alone will cause marked improvement on the tinnitus or hearing, but it softens the sclerotic tissue in the drum membrane and around the ossicles; inflation and massage cause wider excursions of the drum and freer movements in the articulations. The drug puts the ear into a more receptive mood for treatment. Failure may be anticipated in cases in which there is a calcareous deposit about the foot-plate of the stapes or about the bony articulations of the ossicles. Functional tinnitus is not markedly influenced. The most favorable cases are those in which there is hypertrophy of the connective tissue in the mucous membrane of the tympanum, Eustachian tube, or both. In twenty cases the writer noted marked improvement in seven, some improvement in five, and little or no change in the remainder.

Problems in the Treatment of Pneumonia.—

LE FEVRE, E. *Medical Record,* vol. lxix, No. 8, p. 285, Feb. 24, 1906.

It is claimed that the toxin in pneumonia is essentially a stimulant. Its action is characterized by restlessness and sleeplessness in adults, and in children by convulsions. The exhaustion later in the disease is the natural sequence of the stimulation of the early period. The indications in pneumonia are to eliminate the toxins and overcome their effects. The elimination of the toxins is accomplished by acting on the bowels, skin, and kidneys, but care must be taken that the treatment does not exhaust the patient. Unless contraindicated the writer

uses saline cathartics freely during the early days of the disease. If the toxemia is marked the same sweating should be employed as is used in the treatment of acute uremia. Pilocarpine should not be used, but hot drinks; the liquor ammonii acetatis and citrate of potassium should be employed. A large amount of water should be administered, which if not well tolerated by the stomach may be introduced into the circulation in the form of enemata. Venesection is indicated in cases in which the patient is overstimulated by the toxins. Fresh air is necessary, but cold is not an essential element of the open-air treatment. The writer advises keeping the room at about 65° F. When there is much pain opium or one of its derivatives may be used. Nitroglycerin is not indicated when cardiac failure is suspected, but strychnine, caffeine, atropine, and cocaine should be employed with remedies which act directly on the arterial system, such as digitalis, ergot, and adrenalin. The latter's action is energetic, but its effects are temporary. It should be used in the treatment of sudden vascular collapse.

Ozone in Pulmonary Tuberculosis.—

COTTON, J. H. *Montreal Medical Journal,* vol. xxxv, No. 2, p. 100, February, 1906.

The writer recognizes the great value of open air in the treatment of pulmonary tuberculosis, and this must be supplemented by careful attention to the stomach and digestive organs. The food should be highly nutritious, easily digested, and rich in proteids. It should consist chiefly of milk, raw eggs, rare cooked meats, game, fish, oysters, vegetables, and bread, together with lactalbumin. The latter is obtained by treating whey with alcohol. It is the most assimilable of all the proteids and is rapidly absorbed. In addition to the foregoing he employs inhalations of ozone, using camphoric superoxide as a carrier. The latter is to overcome the irritating effects of large quantities of ozone upon the mucous membrane of the respiratory tract. For producing the ozone he uses an electric generator run by an alternating current of 110 volts. The generator is placed in the patient's bedroom, which should be large, well ventilated, and light. After the patient has inhaled the nebulized camphoric superoxide for three minutes the current is turned on, and the generator allowed to run from eight to thirty minutes. The patient rests in this atmosphere from 9 P.M. to 7 A.M., and for four hours during the day, with windows and doors closed. During the intervals the room should be thoroughly ventilated, and the patient should take exercise in the open air. Patients with a febrile temperature should of course not exercise.

Spinal Anesthesia by Magnesium Sulphate.—

HAUBOLD, H. A., and MELTZER, S. J. *Journal of the American Medical Association,* vol. xlvi, No. 9, p. 647, March 3, 1906.

A history of seven cases is given in which magnesium sulphate was employed in solution by intraspinal injection to produce surgical anesthesia. One cubic centimeter of a 25-per-cent solution to 25 pounds of body weight is capable of causing complete anesthesia and paralysis of the lower part of the body, but not until two or three hours after the injection. The largest dose employed was 18 cubic centimeters, in an operation on the leg. The operation was performed forty-five minutes after the injection, and about three hours later a deep general anesthesia set in and lasted for many hours. In all cases a rise of temperature was noted, which disappeared in from thirty-six to forty-eight hours. The pulse was always of good quality. Vomiting occurred in most cases, but as a rule it was only ordinary regurgitation without contraction of the abdominal muscles. Urinary retention lasting from

twenty-four to forty-eight hours occurred in most cases. Washing the subarachnoid space by a withdrawal of a few cubic centimeters of the fluid and injecting an equal amount of salt solution will prevent after-effects.

The conclusion that the writers draw is that intraspinal injection of magnesium sulphate is capable of producing anesthesia, and if carried out with caution seems to be a safe anesthetic. It is well to inject one cubic centimeter of a 25-per-cent solution of magnesium sulphate for every 18 or 20 pounds of body weight, and then wait about two hours. By that time the analgesia will be sufficiently advanced to permit the performance of an operation on any part of the lower half of the body. A small dose of chloroform should be administered to divert the patient's attention and hasten the complete anesthesia. An immediate washing of the spinal canal should follow the operation in all cases. It is important that the salt should be chemicaly pure and the solution sterile.

Eucalyptus Oil in Ankylostomiasis.—

PHILLIPS, L. P. *Lancet,* vol. clxx, No. 5 of vol. i, p. 285, Feb. 3, 1906.

Hermann first employed eucalyptus oil and chloroform as a vermifuge in this affection. The writer first used it in four cases in which thymol failed. In these four cases the eucalyptus oil and chloroform used expelled 150 worms, and a second dose was followed by the extrusion of 30 more worms. The writer employed a mixture of eucalyptus oil 2.5 grains, chloroform 3.5 grains, and castor oil 40 grains. The patient is given a saline purge in the evening and fasts all night. On the following morning half of the above mixture is given, and at the end of half an hour the remainder. He is kept in bed still fasting until the bowels act. Should any depression occur after the first half of the drug is given, the second half is omitted. In young boys and feeble, anemic patients the dose is divided into thirds and given at twenty-minute intervals. The dose can be repeated every other day. In 44 cases this method was successful. In 21 of these cases the first dose was sufficient, and in 16 two administrations were given. Some of the cases were remarkably successful, in one case the first dose expelling 329 worms and a second dose none. The treatment is far more satisfactory than the thymol treatment and is not so irksome for the patient. It can be given as often as three times a week, and this shortens the stay of the patient in the hospital.

The Internal Use of Carbolic Acid.—

BENEDIKT, M. *International Clinics,* vol. iv, 15th series, p. 39, 1906.

Many years ago the writer employed hypodermic injections of two-per-cent solutions of carbolic acid in rheumatic inflammations and in acute polyarthritis. This use of carbolic acid antedated the introduction of salicylic acid. The extensive employment of the latter prevented the more extended use of the former. The digestive disturbances and tinnitus so common after the use of salicylic acid are never observed with carbolic acid. The latter is free from unfavorable influences upon the cardiac apparatus. Carbolic acid and the salicylates might with advantage be combined, admitting of smaller doses of the latter. In the cardiac complications of rheumatism injections of carbolic will be found very useful combined with the salicylates administered by the mouth. Injections of two-per-cent solutions of carbolic acid are useful in tenosynovitis and other painful affections of the tendons. Injections of carbolic acid about a rheumatic joint not only affect the tendons but also the aponeurosis, periosteum, and even the bone. In syphilitic periostitis it is useful and relieves the pain. In neuritis not due to syphilis the injections have relieved the pain, particularly when cocaine

was combined with the acid. Carbolic acid is a powerful local antiphlogistic and absorptive agent, and it has valuable anodyne effects.

Non-operative Treatment of Prostatic Hypertrophy.—

REYNOLDS, W. S. *Medical Record,* vol. lxix, No. 7, p. 260, Feb. 17, 1906.

An operation for prostatic hypertrophy should not be performed until after proper systematic treatment. If such palliative treatment fails the patient is ordinarily in better condition to undergo radical interference. In catarrhal prostatitis massage should be employed as often as necessary to free the glands and relieve the congestion. Such massage is contraindicated where there are interstitial changes. Alcoholics must be interdicted and the urine carefully observed. The best remedy for relieving congestion is nitrate of silver, the application to be made with a rubber catheter attached to a small syringe. The solution should be mild at first, and increased or decreased in strength according to the effect produced. If the patient uses the catheter himself, definite instructions must be given as to the manner of using it and of the method of keeping it clean. Many patients under such treatment will lead comfortable lives and often avoid an operation which may be disappointing in its results.

Eserine in Ophthalmic Practice.—

BRAV, A. *Therapeutic Gazette,* vol. xxii, No. 2, p. 80, Feb. 15, 1906.

Formerly eserine was employed rather frequently, but at present its use is limited to conditions in which there is increased intraocular pressure. In paralysis of accommodation it is useful because of its action on the ciliary muscle. The effect is transitory, and in paralysis of short duration it should not be used. It will counteract mydriatics and cycloplegics, but its use for such purpose is apt to be followed by headaches and neuralgic pains. In marginal ulcers of the cornea with danger of perforation eserine may be used to prevent prolapse of the iris. In keratoconus it lessens the contraction of the pupils, decreases intraocular pressure, and reduces the strain upon the weakened cornea. Its greatest value is in glaucoma, and it may abort an acute attack of this disease; it is of service in the acute inflammatory and the chronic non-inflammatory forms. It is useful in paralytic mydriasis, coal-miners' nystagmus, and neuralgic pains of the eyeball, especially in elderly people with a hardened sclera. Photophobia due to retinal hypersensitiveness is often relieved by weak solutions of eserine. Eserine should not be employed in keratitis, iritis, cyclitis, and it is harmful in acute choroiditis, retinitis, or chorioretinitis. It should not be used in myopic eyes.

Massage and Motion in Fractures.—

NORSTRÖM, G. *Medical Record,* vol. lxix, No. 9, p. 340, March 3, 1906.

In the majority of simple fractures massage is useful in two stages: at the beginning it favors absorption of effusions and diminishes swelling and local tenderness; after the removal of apparatus, if such has been used, massage reaches the functional weakness, overcomes induration, and stimulates the muscular activity. Massage facilitates the diagnosis of fracture in that it allows of an earlier application of permanent apparatus when the latter is indispensable. Massage does away with long periods of immobilization and stimulates local nutrition. Fractures of the humerus are least favorable for treatment by massage. In fractures of the radius a roller bandage is all that should be used around the joint. In fractures of the olecranon the older treatment of immobilization is the best, a rule which also holds in fractures of the lower extremity of the fibula. In cases of fracture of the neck of the femur massage is not as important as early

immobilization. The writer has had good results in the treatment of fractures of the lower extremity of the fibula by massage. In fractures of the shaft of the fibula it is useful, though not as valuable as when the injury is in the neighborhood of a joint. Massage has a distinct analgesic effect.

Aspiration of the Tympanic Cavity in Acute Otitis Media.—

FRIDENBERG, P. *Medical Record,* vol. lxix, No. 9, p. 350, March 3, 1906.

The writer has followed this procedure for about six years. After paracentesis of the drum he presses against the external meatus a small glass bulb having a width of about five-eighths of an inch. It is olive-shaped, with a blunt tip. Suction is then applied and gradually increased, until there is a flow of fluid from the middle ear and the glass bulb becomes more or less filled. Such aspiration relieves the pain and provides for free drainage, several drachms of fluid being often removed. It overcomes the tendency of the incision in the drum to close. The removal of inflammatory exudate and the flowing out of blood serum into the tympanic cavity prevent septic clot formation. In the cases of young children, in which there may be doubt as to whether the drum has been properly opened, the application of suction will immediately settle the question.

Adrenalin in Neuralgia and Neuritis.—

CARLETON, H. G. *American Medicine,* vol. xi, No. 8, p. 268, Feb. 24, 1906.

The writer reports thirty-four cases of various forms of neuralgia and neuritis, the most of which were relieved by applications of adrenalin chloride. The greatest and most permanent benefit was obtained in the functional and neuralgic cases. In those that were of reflex origin there was symptomatic improvement. The manner in which the adrenalin was employed is not fully stated, but in some a solution was used, and in others an ointment. The composition of the ointment is not given. In one case of infraorbital neuralgia a solution of 1 in 3000 of adrenalin chloride was applied along the course of the infraorbital nerve. In the course of a few minutes the pain ceased.

Brometone in Epilepsy.—

KEMPSTER, W. *Therapeutic Gazette,* vol. xxii, No. 2, p. 85, Feb. 15, 1906.

Brometone is produced by the action of caustic alkalies upon a mixture of bromoform and acetone. It is a white crystalline body containing 77 per cent of bromine. It has a camphoraceous odor and taste. During the past two years the writer has employed it in eight cases of epilepsy, the histories of which are given. In all of the cases the brometone acted as a prompt and characteristic sedative, demonstrating its control of epileptic seizures and limiting their frequency and severity. In none of the cases was there nausea, vomiting, or eruptions on the skin. It has a marked effect in lessening nervous tension, a symptom frequently observed in epileptics.

Digital Irritation of the Epiglottis in Asphyxia.—

FREUDENTHAL, W. *St. Louis Medical Review,* vol. liii, No. 9, p. 161, March 3, 1906.

The writer has used a method which he has found especially useful in chloroform asphyxia, and which is based on the theory that chloroform syncope is due to respiratory paralysis, and that the indication to be met is to stimulate respiration. This is best accomplished by irritating the epiglottis. The finger is introduced into the patient's mouth, carried back to the epiglottis, and moved to and fro over this structure. This is the most powerful means of stimulating reflex action. The writer has had two opportunities of trying the method: one in a case of chloroform collapse, and the other in a case of drowning. In the latter the jaws were tightly clenched and the body cold;

no pulse could be detected; respirations were abolished. Upon irritating the epiglottis a quantity of water escaped and breathing was resumed. Respiration stopped, but by repeated titillating of the epiglottis respiration was finally and regularly established.

THERAPEUTIC BREVITIES.

Treatment of Acne.—

D. Lieberthal in the *Lancet-Clinic* of December 30, 1905, says that the comedo is in the majority of cases the forerunner of the acne nodule and pustule. The comedo is best removed by a comedo extractor, which should have rounded edges. The pressure should be moderate, and if the comedo does not escape it is best to puncture with a narrow bistoury. This should be done by the physician. The papules and pustules are treated by lancing. When more active methods are not employed it is of value to cover the parts with mercurial plaster for a few nights. Various useful methods have been devised, the main local applications consisting of sulphur, salicylic acid, resorcin, and soap. The best treatment, however, is the *x*-ray. In many cases irradiations will obviate the necessity of lancing the nodules and pustules. That good results may obtain certain rules should be observed. A soft or medium tube is used, and the first application is made for about five minutes, with the tube at a distance of ten inches. An interval of one week should elapse before the next treatment. Gradually the tube distance is diminished and the time of exposure increased, and the intervals shortened to twice weekly or every other day. Under no circumstances should the tube be approached nearer than five inches, nor the time of exposure exceed ten minutes. Any irritation or pigmentation should be followed by a discontinuance of the *x*-ray until the symptoms have subsided. The treatment of acne vulgaris is a protracted one, and patience must be urged on those who seek a cure. The physician should bear in mind that certain patients will not tolerate the *x*-ray even if it be applied with all possible precautions and in mild dosage.

The Roentgen Ray in Enlarged Glands of the Neck.—

M. E. Dovaston (*Lancet,* Feb. 10, 1906) reports the case of a girl 18 years of age who was seen in 1904. At that time there was a mass of enlarged glands extending from the angle of the jaw on both sides of the neck and meeting at the chin. They were hard, elastic, and movable, and diminished in size from above downward. The individual glands varied in size from a walnut to a hen's egg. The enlarged glands followed an attack of scarlet fever in May, 1900, the right side of the neck being first involved. An operation for their removal was undertaken in 1902. The following year the glands on the left side of the neck became enlarged. Treatment with *x*-rays was begun on September 26, 1904, and continued until July, 1905. The exposures were given for the first two months four times a week, and afterward three times a week, and in the last five months twice a week. Under the treatment the glands gradually became discrete, lessened in size, and later disappeared. The contour of the neck was restored, and there has been no recurrence up to the date of the report, February 1, 1906.

Strength of Physiologic Saline Solutions.—

Hallion and Carrion (*International Clinics,* vol. iv, 1906) discuss saline injections and the amount of sodium chloride that such injections should contain. When sodium chloride solutions were first employed they varied in strength from 0.7 to 0.75 per cent. These were known as physiologic solutions. A later

study of osmosis led to the adoption by some observers of a 0.9-per-cent solution as being isotonic. The writers maintain that osmosis alone should not be the governing factor, and this larger percentage is too great and introduces into the circulation too much salt, which must be eliminated by the kidneys. The serum of the blood contains 6.6 per cent of sodium chloride, and if a solution as weak as this is introduced it contains too much water. On the whole it is better to introduce an excess of water rather than an excess of salt, because the former is rapidly gotten rid of by the kidneys. A proper medium is the 0.7 per cent. This is about midway between the isotonic 0.9 per cent and the actual amount of sodium chloride found in the blood.

Treatment of Migraine.—

M. Carron (*Presse Médicale,* No. 57) recommends cannabis indica to be used systematically and in increasing doses for a long period of time in this affection. He begins with one-fourth grain of the alcoholic extract, one pill being taken at bedtime for the first thirty days. If this gives sufficient relief, the same dose is persisted in. If the attacks recur, the dose is doubled, giving half a grain at night for two weeks. If this is insufficient, a quarter of a grain of the extract is given in the morning. Thus three-fourths of a grain is given in a day, which amount may be continued for a year. If this controls the attack there may be a gradual withdrawal of the drug, which may be used occasionally by the patient at such times as his experience indicates that he is more liable to an attack.

Stovaine and Adrenalin for Local Anesthesia.—

Blondeau (*Journal de Méd. et de Chir.,* Aug. 25, 1905) finds that the combination of adrenalin and stovaine is quite as good as that of cocaine and adrenalin. The advantage of such a mixture lies in the fact that the toxic effects of the cocaine are largely eliminated. A solution of one per cent of stovaine can be employed in a dose of two cubic centimeters, to which four drops of a one-per-cent solution of adrenalin is added. Such a mixture will suffice for most local operations, such as opening a hydrocele, operating on a lipoma, or other similar slight surgical interference. Like the same mixture of adrenalin and cocaine in operating in vascular tissue, it is necessary to be on guard lest secondary hemorrhage occur. The adrenalin will contract the blood-vessels at the time of operation, so that there will be very little bleeding.

Stovaine as a Spinal and Local Anesthetic.—

G. L. Chiene (*British Medical Journal,* Jan. 27, 1906) in a paper before the Edinburgh Medico-Chirurgical Society points out that stovaine has many advantages over cocaine as a local anesthetic. It possesses antithermic and antiseptic properties, and it is far less toxic than cocaine. There was a marked difference when this substance was injected into the spinal canal. The quantity that may be introduced under the subarachnoid space may vary from 2 to 10 centigrammes. Used in this way the anesthesia begins in the perineal region and then involves the toes and feet. The level to which it arises is due to the amount of the drug injected. Chiene has employed stovaine to produce spinal anesthesia in fourteen cases, and the results were highly satisfactory.

Exercise in Paralysis Agitans.—

Paralysis agitans is one of the most hopeless affections of the nervous system. Hyoscyamus is the only remedy that has seemed to be of value, and its use is only palliative in lessening the tremor and discomfort of the patient. W. Lawarew (*Zeitschrift für Diat. und Physik. Therapie,* November, 1905) describes a case in

which marked improvement was obtained by the use of systematic exercises. The case was one in which the disease was pronounced, it having existed for over five years in a man 43 years old. The patient was quite helpless, needing assistance in eating and drinking and in changing his position. The exercises were both active and passive and were performed many times a day, but always short of fatigue. In the particular case the tremor was not pronounced, but the rigidity was very marked, and the latter was rapidly ameliorated by the exercises. As a result of the treatment the patient was soon able to go about unaided, could halt and turn at the word of command, and the propulsive movement disappeared.

Sheet Paraffin in Eye and Nose Lesions.—

E. Moraweck and G. C. Hall (*Journal of the American Medical Association,* Feb. 24, 1906) recommend the use of splints made of dentists' sheet paraffin in nasal surgery to prevent adhesions. The paraffin can be cut to suit the needs of the case, and if cleanliness is employed it is not necessary to keep it in irritating antiseptic solutions. Splints made in this way are much better for preventing adhesions than either the gauze tampon or the Bernay splint, and they are much less painful and more convenient. Such splints are useful after cautery operations, submucous resection of the septum, and turbinectomy. In eye work they are used after extensive injuries to the conjunctiva where adhesions are anticipated.

Prevention of Stricture of the Urethra.—

E. G. Ballenger (*American Medicine,* March 3, 1906) says the worst complication likely to follow a chronic urethritis is stricture, which is caused by a chronic inflammation of the subepithelial tissue. The inflammatory exudate becomes organized and contracts. The best method of preventing stricture is to treat these cases by medicated sounds. In this way an ointment can be forced into the follicles and depressions, where the germs are not reached by irrigations and injections. The exudation around the follicles is frequently the starting-point of a stricture. No other single treatment combines so many beneficial factors, such as dilatation, cold massage, and medication uniformly applied to the whole membrane.

Peroxide of Zinc in Skin Diseases.—

Under the trade name of ektogan (*Le Nord Médical,* Feb. 15, 1906) this substance has been extensively employed in the treatment of syphilitic and tuberculous ulcers and fistulas. Ektogan may be employed in powder form or incorporated with a base to form an ointment. It is an active disinfectant which disengages free oxygen in a nascent condition, and is especially useful in ulcers, where there is an underlying constitutional state such as alcoholism and diabetes, and in which there is a tendency to gangrene. In burns a pomade containing 10 per cent is a bland application which will prevent adhesion of the dressings. Boils should be treated with an ointment containing 20 per cent. Ektogan has a purely local action.

Animal Spleens as a Hematic.—

E. J. Williams (*American Medicine,* Feb. 10, 1906) has been investigating animal spleens and has found them palatable. They may be cooked in various ways. They contain ¾ grain iron and 1.5 grains of phosphorus per ounce. When raw the spleen has a pulpy consistence, but heat coagulates the free albumen and imparts a consistency in which they may be cut and chewed. They must be quite fresh, as decomposition takes place rapidly, and they cannot be kept over night even on ice. They are quite likely to be diseased, as all infectious diseases involve this organ. All unhealthy spleens should be rejected.

MEDICINE.

Arteriosclerosis as a General Disease.—

STENGEL, A. *American Medicine,* vol. xi, No. 6, p. 195, Feb. 10, 1906.

Arteriosclerosis is not merely a passive process of hardening of the vessels. A proper conception regards it as a general disturbance of the whole organism. In its early stages the disease is difficult of recognition. In the middle period of life the arterial disease is easily recognized, but then the secondary organic changes play an important rôle. The final stage is one of failure of circulation and terminal infection. Arteriosclerosis as ordinarily seen begins in middle or later life, progresses regularly, slowly involving all the vessels uniformly with a coincident involution of the body as a whole. In younger subjects its progress is more rapid, and the general changes are often quite out of proportion to the arterial involvement. Some investigators have insisted that there is a preliminary presclerotic stage of continued high blood-pressure which is to be attributed either to a spasm of the arterioles due to toxic or nervous influence or to a change in the viscosity of the blood causing obstruction to the circulation. The writer's observations show that in the early stages there is often a decrease of tension with a tendency to temporary elevations, that the condition in short is due to loss of elasticity in the vessels due to a toxemia followed by degeneration of the vessel walls. The disease has several types. In the nutritional form there is obscure disturbance of the general health with a tendency to digestive disorders and anemia. In the neurasthenic form there may or may not be definite nutritional disorders. In the nervous type there is a tendency to vertigo, tinnitus, syncopal attacks, and in the early stages temporary paralysis, spasmodic or convulsive disorders or disturbances of consciousness in advanced cases. The more advanced stages of the disease may be clasified under the following headings: (1) Thoracic: (*a*) cardiac disturbances incident to special involvement of the coronary arteries; (*b*) aortic, aneurismal dilatations and sclerotic and calcareous roughening, which cause embarrassment of cardiac action. (2) Abdominal: (*a*) renal, shown by the symptoms of chronic interstitial nephritis; (*b*) atrophy of the intestinal mucosa with a tendency to chronic colitis; (*c*) pancreatic changes difficult of recognition, often active in diabetes; (*d*) hepatic, occurring as cirrhosis; (*e*) cerebrospinal, with numerous and varied symptoms; and (*f*) arteriocapillary changes manifested in moderate circulatory disturbance.

Diagnostic Value of the Spirochaeta Pallida.—

RICHARDS, G. M. O. *Medical Chronicle,* vol. x, No. 5, p. 273, February, 1906.

As an index of the interest which the discovery of this organism has excited we would refer to the fact that the author cites 117 references in the literature since the publication of the original paper early in 1905. Hoffman in reviewing the present status of the discovery as late as October, 1905, says the spirochaeta is found in the most varied lesions of syphilis, and it is constantly present in recent syphilis. In acquired uncomplicated syphilis it has been found in the deeper parts of the primary affections, in the lymphatic glands, and several times in the blood. In these cases it is always found alone. It has been noted in the internal organs, in specific lesions, and sometimes in the blood of children with congenital syphilis. In non-syphilitic diseases and in healthy subjects it is always absent. In the syphilis of monkeys artificially inoculated it is nearly always found.

The writer has taken the opportunity afforded by a large venereal service to study the relation of this organism to the diagnosis of the disease. In 21 cases of primary sore it was found in all, constitutional symptoms following in each case. In four cases it was

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found, but no constitutional symptoms were noted. One of these was doubtful, and in another the patient was only under observation for one day. In 17 cases of secondary syphilis the spirochaeta was found in various lesions. These cases came under observation in the secondary stage. Apparently after the sore heals and the constitutional symptoms develop the spirochaeta disappears from the sore, but can be found in the secondary lesions, particularly in infected inguinal glands. In 15 cases secondary symptoms were present, but no spirochaetæ were found. Their absence in these cases is attributed largely to faulty technique in not examining a large number of lesions. In six cases of tertiary syphilis the spirochaetæ were not found. In 64 cases of venereal sore or chancroid the spirochaeta was not found, and while the patient was under observation no secondary symptoms developed. The period of this observation varied, but in most instances the time was sufficient to exclude the probability of secondaries developing.

Periodic Variations in Normal Urine.—

EVANS, P. N., and MOORE, W. H. H. *Montreal Medical Journal,* vol. xxxv, No. 2, p. 81, February, 1906.

This study was undertaken to test the varying conditions of the urine in a normal person extending over a considerable period of time. The individual experimented upon weighed about 140 pounds, and was a student leading a sedentary life. No attempt was made to control the diet, which was of the ordinary mixed sort. A summary of the results shows that a wide variation may exist in the urine of a single normal individual within short intervals. The quantity of some of the constituents differed markedly from those accepted as normal. The volume per hour varied from 20 to 90 cubic centimeters, and the total quantity, 910 cubic centimeters in twenty-four hours, was decidedly less than the quantity usually accepted as normal. A number of studies in other normal individuals showed the total quantity to be not far from 1000 cubic centimeters, with a decided maximum hourly volume before the noon hour. The reaction was acid in 113 tests, neutral in 33, and alkaline in three samples. The supposed connection between alkalinity and digestion was not apparent in any of the series. The results indicate that rest rather than gastric digestion diminishes the acidity of the urine. The specific gravity varied from 1014 to 1032, with a grand average for all the tests of 1025. The figures agree well with those commonly accepted for normal urine, except that gravities above 1030 were noted in ten samples out of 149. In each series of observations the forenoon samples were decidedly lower in specific gravity than the others. The solids per hour varied from 1.30 to 3.26, the grand average of the four series being 2.09 grammes, or 5.2 grammes in twenty-four hours; the total quantity of solids being considerably less than that noted as normal. In every series a decided maximum occurred shortly before noon. The grand average of all the tests gave 2.31 per cent of urea, being somewhat higher than the normal average of two per cent.

A Peculiar Cutaneous Pigmentation.—

WEBER, F. P. *British Journal of Children's Diseases,* vol. iii, No. 1, p. 19, January, 1906.

The writer reports a curious case of pigmentation which developed in a girl 15 years old. He suggests that it was probably an incomplete form of Recklinghausen's disease presenting the peculiar pigmentation but without the superficial tumors found in that disorder. The pigmentation affected the trunk and neck chiefly, the extremities to a less degree, and the face was quite free. There were no areas of leukoderma. There were diffuse brownish patches over the upper part of the back and neck which were sharply defined and

probably stationary. The upper border was well defined, but below it merged gradually into the ordinary skin. There were brown spots in small patches plentifully scattered over the trunk, the paler ones having been most recently developed. There was a group of very dark, almost black, spots on the left side of the thorax resembling a group of pigmented nevi, but not raised above the level of the skin. These blackish spots were first noticed about three years ago. The earliest pigmentation noticed by the mother was at the back of the neck when the child was about 18 months old. Since that time the pigmentation has gradually developed. The patient's general health was good, and the examination of the various organs was negative. The general intelligence and mental development were up to the average. The patient has been subject to headache and bilious vomiting, but there has been no faintness such as would suggest Addison's disease. The mother suffers from small patches of xanthelasma palpebrarum, which appeared some years ago. Other than this there have been no anomalous cases of pigmentation in the family. The pigmentation occurs chiefly in the covered parts of the body, and there is no special liability to freckle from exposure to the sun. This is the reverse of what occurs in Kaposi's xeroderma pigmentosa.

Sciatica of Abdominal Origin.—

FORBES-ROSS, F. W. *Lancet,* vol. clxx, No. 2 of vol. i, p. 89, Jan. 13, 1906.

Attention is called to two cases of sciatica which had their origin in the abdominal cavity. The first patient was 43 years of age, married, a multipara, who consulted one year before for a menorrhagia. She had suffered for the past six or seven years with constant pain in the tenth dorsal area accompanied by attacks of sciatica, which had been attributed to gouty neuritis. A small papilloma was removed from the cervix, and three weeks later a small, tense, cystic tumor of the size of a small orange was removed from the left ovary. The operation was followed by a prompt cessation of the sciatica, as well as the pain at the tenth dorsal segment. The explanation of the pain is that there was irritation of one dorsal segment transmitted to another by the extreme pressure of the distending cyst on the nerve endings in the ovary. Another case is mentioned in which there was persistent and intense pain down both legs with cramps in the calves. This patient had a tumor of the cervix low in the pelvis, which caused great discomfort and pressure upon all of the pelvic organs. The cases illustrate the importance of a thorough pelvic examination in all cases of sciatica.

Reflex Neuroses Due to the Appendix.—

GRANDIN, E. H. *New York Medical Journal,* vol. lxxxiii, No. 2, p. 72, Jan. 13, 1906.

A number of case histories are given in which neurasthenic and gastric symptoms due to involvement of the appendix are given. One patient complained of constant gastric disturbance; she was a general neurasthenic, and had had gastric lavage and drugging for a period of eight years. There was a sense of fulness over the cecum which was quite constant, and she was relieved whenever the bowels moved quite freely. An exploratory incision was made, which showed that the appendix was twisted posteriorly and that the cecum was adherent to the ileum. The appendix was removed and adhesions were broken up. Within a few weeks the digestive and intestinal symptoms disappeared, and with them the neurasthenic symptoms. Another was a profound neurasthenic who complained of fulness, aching, and dragging in the ileocecal region. Upon exploration the appendix, ileum, and cecum were found united by adhesions. A rudimentary appendix was removed and the adhesions broken up. There was marked re-

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lief from the symptoms. Another case was in a young undeveloped girl with aggravated gastrointestinal symptoms not benefited by routine drug and mechanical stomach treatment. There was tenderness on deep palpation and fulness of the ileocecal region. One kidney was displaced, for which the rest cure was instituted. The result was negative, and later the kidney was anchored and the appendix removed. The latter organ was reddened and thickened, and the tip was attached to the ileum. The pathological report was catarrhal appendicitis. The symptoms disappeared three months after the operation, and the patient gained 20 pounds in weight. Another case was one in which there was a history of a mild attack of appendicitis. Operation revealed an apparently normal appendix, although the pathological report was catarrhal appendicitis. The gastrointestinal symptoms were relieved by the operation.

Albumoses in Urine.—

ELMER, W. P. *American Medicine,* vol. xi, No. 5, p. 169, Feb. 3, 1906.

The presence or absence of albumoses in the urine is of clinical significance, in the diagnosis of many conditions in which there is an increased or diminished leucocytosis. The conditions most likely to give rise to considerable quantities of albumoses are: multiple myeloma of bones; pulmonary tuberculosis, in which they are a guide to the extent of the destruction of the lung tissue; resolution stage of croupous pneumonia, septicemia, and pyemia, in which there is considerable absorption of partially disintegrated proteid along with other septic products; abscesses, especially before they are completely walled off by exudates; carcinoma and sarcoma when sloughing or when the tissues surrounding them are disintegrating rapidly from pressure or lack of blood-supply—in fact, whenever excessive tissue waste is suspected. The writer gives a critical summary of the various tests employed. The reagent used by him is a 50-per-cent solution of sulphosalicylic acid in distilled water, which precipitates all the proteids in the urine. On heating the albumins, globulins and nucleoalbumins are precipitated, while albumoses are brought into solution, from which they are precipitated by cold. In applying the test five drops of reagent should be added to 5 cubic centimeters of clear, cool urine. On contact with the urine, if proteid be present a grayish-white cloud appears. On heating, if albumoses alone be present in the urine it will become clear, to become cloudy again when cooled. If albumins or globulins are present they will coagulate on boiling. The liquid should then be filtered and the filtrate cooled, when if albumoses be present a cloud will form, which disappears on further heating. This test is very delicate. A convenient method of detecting a faint reaction is to divide the urine into two parts, cooling one part while warming the other, and then compare them in front of a dark surface. This test is accurate and simple, and is much better than the more complicated methods suggested by Yarrow and Bang.

Chronic and Periodic Vomiting.—

ROBERTS, D. *Medical Record,* vol. lxix, No. 8, p. 294, Feb. 24, 1906.

The writer gives a résumé of the characteristics of vomiting which may be expected in certain conditions. Vomiting of a chronic type following a gradually developing epigastralgia in the height of digestion, one-half to three hours after the ingestion of food, may be due to a gastric or duodenal peptic ulcer. Chronic vomiting occurring ten to fifteen minutes after food is due to stenosis of the cardia, nervous abnormality, cerebral lesion, or protracted acute gastritis. Copious vomiting ten or more hours after food indicates muscular insufficiency. Its frequent repetition indicates a permanent lesion interfering mechanically with the exit of food. Vomiting in the night is especially liable to

occur in cholelithiasis, periodic hypersecretion, muscular insufficiency, and nervous abnormality. Nausea and attempts at vomiting when the stomach is empty indicate a cause other than a gastric lesion. Morning nausea indicates pregnancy, alcoholism, pharyngitis, nephritis, or nervous trouble. Periodic vomiting of clear gastric juice of normal or supernormal acidity in considerable amount indicates a secretory neurosis or an ulcerative lesion. Vomiting as a sequel of headache, accompanied by severe nausea, but by no gastric or abdominal symptoms, characterizes attacks of migraine. Attacks of vomiting of sudden onset with tinnitus, deafness, and vertigo are to be attributed to disturbances of pressure in the internal or middle ear. Periodic attacks of vomiting of sudden onset associated with more or less severe gastric pain and nausea, retraction of the abdomen, obstinate constipation during but not preceding the attack, and freedom from abdominal tenderness are suggestive of the spinal crises, idiopathic nervous vomiting, and lead poisoning. Periodic attacks of vomiting after abdominal colic and constipation with localized or general tympany are suggestive of chronic intestinal stenosis.

Cancer of the Stomach.—

Dowd, C. N. *Medical Record,* vol. lxix, No. 3, p. 91, Jan. 20, 1906.

Attention is called to the large number of deaths reported by the census bureau during 1900. It is shown that at least 9000 deaths occurred in the United States during that year. The writer regards cancer of the stomach as primarily a surgical disease, and considers that the mortality from the operation is no greater than from others that are frequently performed. An illustrative case is given, in which a pylorectomy was performed on a man 54 years of age in 1902. He has since remained in good health. An early diagnosis in cancer of the stomach is most important. The initial symptoms are loss of appetite, pyrosis, and epigastric discomfort. These symptoms precede the vomiting by months. In 73 per cent of the writer's cases it had existed about seven months before admission to the hospital. Sometimes these symptoms were present after every meal, and others only at irregular intervals. Pain, though not so characteristic, is also an important symptom. Exploratory operation is valuable in helping to establish the diagnosis. A small incision of one and a half or two inches is sufficient to admit of a digital exploration. This will keep the patient in bed only two or three days.

The Heart in Tuberculosis.—

Hutchinson, W. *Medical Record,* vol. lxix, No. 9, p. 335, March 3, 1906.

The small relative size of the heart is a prominent factor in the predisposition to tuberculosis. In animals which are relatively immune to tuberculosis the heart is equal to or exceeds 1/100 of the body weight. Most of the herbivora have small hearts and are very susceptible, while exceptions to this rule, such as the sheep and deer, are distinguished by having large hearts. A weak, undersized, muscularly deficient heart, indicated by a weak, rapid pulse and defective first sound, is one of the most constant and significant conditions in consumption. Such cardiac condition frequently precedes the development of tuberculosis, and the more marked these conditions and the earlier they are noticed in the disease the more serious the prognosis. In tuberculosis, as in other infectious diseases, the chief seat of toxin production is in the lungs or bowels, but the chief strain falls upon the heart, and death in the majority of cases is due to toxic heart failure. The undersized and inadequate heart is, like the round, high index chest, the persistence of conditions normal to the period of puberty. The condition of the heart should be the prin-

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cipal guide in the diagnosis, prognosis, and treatment of consumption. If under treatment the pulse is slowed and strengthened the lung may be neglected. A persistently rapid pulse without other ascertainable cause should always arouse suspicion of incipient tuberculosis.

Acute Articular Rheumatism.—

HARGENS, C. W. *Journal of the American Medical Association,* vol. xlv, No. 9, p. 644, March 3, 1906.

Attention is called to the confusion in the common use of the term rheumatism. It may be defined as an acute febrile non-contagious affection characterized by nomadic multiple arthritis, profuse sweating, and proneness to endocardial complications. In the majority of cases it is autotoxic, the origin of the poison being in the alimentary canal. The disorder may be complicated by microbic invasion. An early realization of this possibility will lead to prompt treatment, which will prevent the secondary infection. Treatment should consist in complete rest between dry blankets in a warm, sunny room, thorough cleansing of the alimentary canal, and a careful regulation of the diet, excluding proteids so far as possible and xanthin-forming foods. Elimination should be actively carried out, the skin kept active by baths, and laxatives freely used. Large quantities of alkaline water should be administered. The dose of the salicylates should not exceed three drachms daily, and they will be better borne if elimination is active. The salicylates should be discontinued as soon as possible and the syrup of the iodide of iron or Fowler's solution substituted. The non-proteid diet should not be persisted in too long. Locally hot fomentations can be used, or the affected joints wrapped in cotton and a splint applied. Unless the weather is extremely favorable patients should be kept in bed at least a week after the temperature becomes normal. In all cases a careful watch should be maintained to guard against relapse.

Fever in Chronic Endocarditis.—

THACHER, J. S. *American Journal of the Medical Sciences,* vol. cxxxi, No. 1, p. 29, January, 1906.

The writer has observed cases of chronic endocarditis without complications in which fever has been a striking symptom, but the course of which was not malignant. It has been suggested that these febrile cases without evidences of secondary lesion are infective. In examining the records of the Presbyterian Hospital the writer found 901 cases which were sufficiently complete for study. The results show that a large proportion of hospital cases of chronic endocarditis even when uncomplicated have fever. In many this fever is of high degree and long continued without apparent cause. Neither the presence nor the degree of fever strictly follows the variety or degree of endocardial lesion. The febrile lesions with hemorrhagic eruptions are very fatal. The febrile uncomplicated cases are about as fatal as cases with marked complications, and very much more fatal than the afebrile cases. Some of the cases with high and prolonged fever get better. The rheumatic febrile cases of chronic endocarditis are as favorable as the afebrile cases, or possibly more so.

Enterospasm and its Mimicry of Appendicitis.—

HAWKINS, H. P. *British Medical Journal,* No. 2350, p. 65, Jan. 13, 1906.

The writer starts out with the statement that the appendix is sometimes excised unnecessarily, and that certain patients subjected to this operation suffer quite as much after it is performed as before. This is due to the fact that tenderness and pain in the right iliac fossa is thought to point to inflammation of the appendix. If a certain class of these patients are studied the conclusion is almost certain that their troubles are functional rather than structural. That this is not recognized is due to a neglect to discuss the functional disturbances

of the intestine. The functional disorders of the stomach have long had marked attention paid to them, but the intestine is regarded as a hardy tube uninfluenced by defective states of other organs.

Four cases are described. From these the writer draws the conclusion that it is not uncommon for men and women in early adult life to suffer from abdominal pain which from its long duration and the absence of evidence of organic involvement is probably due to functional disturbance of the intestine. Such patients are often neurotic or neurasthenic, and the abdominal troubles vary directly with the mental state. The pain in these cases may occur in short, sharp attacks, or may last for months as an ache or discomfort. The pain is usually in the right or left iliac fossa or in the immediate neighborhood.

Effect of Posture on Cardiac and Vascular Murmurs.—

RUDOLF, R. D. *American Medicine,* vol. xi, No. 9, p. 324, March 3, 1906.

Certain cardiac and vascular murmurs are altered by posture, some being suppressed, while others are heard louder in one position than in another. The venous hum heard in the root of the neck in cases of anemia and conditions of lowered vascular pressure is often only audible when the patient is upright. The arterial bruit is often only heard when the patient is recumbent. Generally all systolic murmurs heard in the cardiac area, if altered at all by posture, are loudest in the recumbent position. Murmurs occurring in the cardiac cycle other than the ventricular systole, if altered at all by posture, are louder when standing than in other positions. The murmurs chiefly affected by changes in posture are of the so-called functional sort, which are always systolic, the chief of which occurs in the second and third intercostal spaces close to the sternum. Posture often has considerable influence upon murmurs due to organic disease. It is urged that in every case in which it is thought necessary to auscultate the heart or the vessels this examination should be conducted in both the recumbent and vertical positions. In descriptions of heart murmurs it should always be stated what postures the patient was examined in.

Roentgen Ray Diagnosis of Chest Diseases.—

TALLEY, J. E., and NEWCOMET, W. S. *Journal of the American Medical Association,* vol. xlvi, No. 8, p. 553, Feb. 24, 1906.

The writers claim that the fluoroscope is superior to the skiagraph in the diagnosis of chest diseases, and is a valuable adjunct if not superior to the usual methods of physical diagnosis. They describe a new form of protective screen, which acts as a recording apparatus, and at the same time protects the operator from burns. A pneumonia developing deep in the chest may be revealed by the *x*-ray before other signs and symptoms are conclusive. In children this method of examination is especially useful. It permits of an early diagnosis of secondary involvement of the mediastinal glands after operations for cancer. In the study of the heart and thoracic vessels the results are most satisfactory. In such cases the fluoroscope shows the moving organs, while the skiagraph resembles more the blurred outlines of a composite picture.

Clinical Observations in Exophthalmic Goitre.—

DOCK, G. *American Medicine,* vol. xi, No. 8, Feb. 24, 1906.

These observations are based on thirty-two hospital cases seen during ten years. Twenty-nine of the cases occurred in women and three in men. The predisposing cause could rarely be discovered. In twelve previous diseases or nervous shock were noted a short time before the characteristic symptoms. In these cases goitre was the first symptom, but in twelve

others there was a goitre observed from three to thirty-seven years before the other symptoms came on. The thyroid gland was enlarged in all cases. In twenty-six a systolic murmur was audible over the thyroid. Tachycardia was present in all but two cases, and in one of these had been present before the observations began. The blood-pressure showed striking differences. In some the pressure was high, up to 180 mm. Eye symptoms were absent in only three cases. Emaciation was a marked and striking symptom in two cases, amounting to almost or quite half the body weight. Diminution of hydrochloric acid was observed in a number of cases, but hypermotility was often associated with this. Two of the patients died—one from complicating disease, the other from acute symptoms. Of the other cases a number pursued a chronic course extending to fifteen years. Emphasis is laid on the importance of early diagnosis. The chief procedure for these patients is rest, with symptomatic treatment.

Tissue Metabolism in Phthisis.—

PARKINSON, A. S. *Practitioner,* vol. lxxvi, No. 2, p. 219, February, 1906.

The writer's attention was attracted to the metabolism in phthisis cases by a paper of M. Robin, of Paris. As a result of his study he comes to the conclusion that the respiratory capacity is diminished below the normal in phthisis. The relative respiratory capacity per centimeter of stature is also diminished. The amount of carbon dioxide exhaled is increased above the normal, as is also the consumption of oxygen. The total purin nitrogen excreted is increased above the average normal amount; in a word, the tissue metabolism is increased. The presence of albumose in the urine is not indicative of a febrile condition, but simply shows the presence of an infective condition in the body. If it is absent in a particular case, it is probable that there is no breaking down of the lung tissue, and this indicates a more favorable prognosis. The phthisical chest is deeper proportionately to the width and is longer in proportion to the width than a normal chest. It is probable that this shape of the chest indicates a predisposition to phthisis, as it shows an arrest of the normal development.

SURGERY.

Appendicostomy and its Possibilities.—

BENNETT, W. H. *Lancet,* vol. clxx, No. 7 of vol. i, p. 419, Feb. 17, 1906.

Flushing the large intestine is not a simple proceeding. With a long tube and other devices there is often failure in thoroughly washing the intestine. In such cases colotomy or opening the cecum is open to serious objections. The vermiform appendix may be utilized for purposes of irrigation. The operation is in ordinary circumstances very simple, an oblique opening into the abdomen being made in the same way as the abdominal walls are opened for the removal of the appendix. The opening should be of sufficient size to admit two fingers. The edges of the divided peritoneum are secured by pressure forceps, and one or two fingers are introduced and the appendix hooked up and brought out of the wound. The procedure is simple where there are no adhesions. The appendix after being drawn out through the wound is held in position by a stitch of catgut or silk passed through the mesoappendix to avoid strangulation of the included mesoappendix. This suture may be knotted after it has been passed through that structure before its ends are utilized for approximating the edges of the peritoneum. The protruding appendix is even more simply secured by passing a sterilized safety-pin through it on each side between the muscular and mucous coats. The abdominal wound is then closed beneath the pins. The day following the operation the pro-

truding appendix is divided a quarter of an inch from the abdominal wall and sutured to the skin. A full-sized soft-rubber catheter can be passed down the appendix into the cecum without the patient being conscious of its presence. There is no regurgitation through the appendix, as the sphincter at the cecal orifice closes. The use of the appendix for obtaining a permanent opening to the bowel is far superior to the opening into the cecum or colon. There is no escape of the contents of the bowel with a corresponding irritation of the skin. A further advantage is the ease with which the opening in the appendix can be closed. All that is necessary is to isolate the stump of the appendix, remove it, suture the peritoneum, and drop the cecum back into the abdominal cavity, just as is done in an ordinary appendectomy.

Observations on the Etiology of Oblique Inguinal Hernia.—

MURRAY, R. W. *Lancet,* vol. clxx, No. 6 of vol. i, p. 363, Feb. 10, 1906.

The writer expresses the belief that the chief factors which determine the descent of the bowel in hernia have not yet been stated. It is generally admitted that herniæ which occur during infancy are due to a preformed sac, but ruptures in adults are ascribed to a local weakness of the muscles and aponeurotic structures. This division into congenital and acquired forms of hernia has been severely criticized by Russell, who believes that a preformed sac is the main factor in the causation of hernia during all periods of life. Macready's tables, based on over 20,000 cases, show that the greatest number of herniæ develop during the most active period of life. In the first year of life there is a large number. There is a marked increase between the ages of 11 and 15 in women, and between 16 and 20 in men. Of 100 ruptured men, 97.5 have inguinal hernia and 2.5 have femoral hernia. In the same number of women 60.3 have inguinal hernia and 39.7 have femoral hernia. Macready calls attention to the difficulty of distinguishing between the two classes of hernial sacs. When the hernia appears during infancy or early childhood the sac is generally regarded as being of congenital origin, but when the hernia appears for the first time during adult life the sac is usually considered to have been acquired.

The writer's experience in operating upon children for the radical cure of inguinal hernia has shaken his faith in the orthodox surgical belief. He found that in children and infants the sac in the majority of cases is separate from the tunica vaginalis, and while its structure is more delicate it exactly resembles the ordinary hernia found in adults. In the majority of instances it is preformed, and the same thing occurs in adult life. In any person with a normal abdominal wall it is almost impossible for hernia to occur. In adults there is some preëxisting malformation or patency of the vaginal process. Partial patency of the vaginal process may persist throughout life. At birth it is often open on one or both sides. There is a tendency to rapid closure in the first three weeks of extra-uterine life, but after the third week closure takes place more slowly. In adult life patency of the canal may be met with up to an advanced age. While not uncommon it is far rarer than in childhood. Macready states that the opening is larger on the right side, and that the tendency to obliteration may be in abeyance and the canal keep pace with growth. This explains why ruptures occur so frequently at the age of puberty. Even where the canal remains open it is infrequent that a rupture occurs. That hernia occurs in some cases and not in others is due to the size of the opening at the internal abdominal ring and the strength of the muscles. The muscles at the internal abdominal ring form a sort of sphincter, and if they are weakened and the

opening is large, the probability of a hernia occurring is good. The appearance of hernia at the age of puberty might be explained by the increased amount of exercise at that period associated with the other factors named. The same thing would obtain with a muscular weakness due to declining years. The hernia which frequently makes its appearance during convalescence from long illnesses is explainable on the same theory of muscular weakness, by which the patent vaginal process is not sufficiently guarded. If this explanation of hernia is correct, it is most important in operating to completely do away with the depression at the internal ring. The operation should be performed early in life, so as to obliterate the funicular process and prevent stretching of the internal ring.

Operative Treatment in Head Injuries.—

SACHS, B. *Boston Medical and Surgical Journal,* vol. cliv, No. 7, 176, Feb. 15, 1906.

If there is extensive injury to the skull, particularly in the parieto-temporal region, if there is evidence of a splintering of the inner table, the presence of a foreign body or of persistent intracranial hemorrhage, operative interference is warranted at the earliest possible moment. *X*-ray examinations and lumbar puncture are valuable diagnostic aids. In comminuted fracture of the skull the surgeon must decide whether or not the danger of infection is increased by surgical procedures. In all cases, but especially in those in which external injury cannot be taken to be the determining factor, the question of surgical interference must be decided on purely neurological lines. It is useless to continue the discussion of the differentiation between concussion, contusion, and compression. It is more important to decide whether the brain has been injured, and if so, if it is near the surface, where it can be reached by operation. If inaccessible, simple trephining may be resorted to, providing there are symptoms of increasing intracranial pressure which cannot be relieved by lumbar puncture or simpler methods. If the injury is in an accessible region a conservative attitude may be adopted, as often nature is capable of causing a certain amount of repair, absorbing hemorrhages or affording relief to inflammatory processes.

In determining the gravity of brain injury disturbances of cardiac and respiratory action, of vesical and rectal control and the condition of consciousness are the most important symptoms. They are the manifestations of increasing intracranial pressure and of other serious injury. Recovery from coma, whatever its duration, is encouraging. A deepening coma is of grave significance. The behavior of the pupilary reflex is of no special value in deciding the question of operative interference. In late cases if the symptoms point to focal lesions surgical measures should be adopted if the lesion is accessible. If the external injury points to one side and the symptoms to another, consider both.

Intracranial Lesions as Sequelae of Chronic Purulent Otitis Media.—

STARR, M. A. *Medical Record,* vol. lxix, No. 10, p. 369, March 10, 1906.

The ordinary cerebral complications of otitis media are abscess of the brain, meningitis, sinus thrombosis, and acute encephalitis. The symptoms of the latter are similar to abscess. In meningitis the number of leucocytes in the cerebrospinal fluid is increased. In cerebral abscess they are not increased unless it is complicated by meningitis. In abscess there is an absence of the microörganisms which are commonly found in meningitis. In acute otitis media the leucocytes in the blood are moderately increased. A sudden increase in the number is an indication of a new inflammatory complication. There is a more rapid rise in the number of leucocytes and a higher leuco-

cyte count in meningitis than in brain abscess. A rapid rise in the ratio of polymorphonuclear leucocytes due to other elements in the blood has been observed in all acute inflammatory processes. A positive diagnosis of cerebral abscess calls for immediate opening of the skull. If the case proves to be one of brain abscess it may be possible to evacuate it and save the patient. If the case proves to be a meningitis, this opening of the skull will not hasten the fatal termination.

The results of surgical treatment of the intracranial complications of otitis media have been more favorable as the operative technique has improved. In the cerebellar cases characteristic symptoms are often lacking. The most striking of those which may be present are the cerebellar seizure, consisting of sudden attacks of extreme vertigo, roaring in the head, relaxation of the limbs, and falling to the ground in a semiconscious state. These attacks are sometimes accompanied by temporary blindness and tonic spasms. They occur especially with tumors which lie in the angle between the cerebellum, pons, and medulla, a place which is frequently the site of abscess.

Operation in Acute Meningitis.—

CROCKETT, E. A. *Boston Medical and Surgical Journal,* vol. liv, No. 4, p. 103, Jan. 25, 1906.

A case of acute suppurative leptomeningitis is described which recovered after an operation. It is believed that many of these cases could be pulled through if operated on at once and the subdural space drained. This relieves the intracranial pressure, which leads to early death. The patient was admitted to the hospital in a comatose condition. She had had a discharge from the ear since childhood, and nine months before the last and severe attack there had been an exacerbation of the aural trouble. Three months later there was an attack of severe pain on the right side of the head, accompanied by nausea, vomiting, and vertigo. For the past nine weeks she had suffered from occasional attacks of nausea, chills, and transient delirium. At the time of admission the temperature was 102°. There was a foul-smelling discharge from the right ear, and the external meatus was filled with a large, firm, red polypus. There was double optic neuritis. Under ether the polypus was removed, which revealed a considerable area of denuded bone, and a bent probe could be passed into the middle cerebral cavity. A curved incision was made over the auricle and the skull opened. The dura bulged but did not pulsate. Upon incising this membrane there was an escape of cerebrospinal fluid. Distinct yellow lines of pus could be seen parallel with the vessels on the surface of the brain. A gauze drain was then placed inside the dura and pushed down toward the petrous portion of the temporal bone. The patient made a rapid and uneventful recovery, and was discharged from the hospital three weeks after the operation.

When to Operate in Appendicitis.—

SANDERSON, S. E. *American Medicine,* vol. xi, No. 10, March 10, 1906.

A proper estimate of the conditions underlying an attack of appendicitis should consider the local condition, the virulence of the infection, and the reaction of the patient. With the local condition as a standard the disease can be divided into: (1) Cases in which the process is confined to the appendix; (2) cases in which the peritoneum is being invaded by bacteria and toxins which penetrate the unbroken wall; (3) cases in which an active peritonitis is well under way, but the process is still localized, suppuration has begun, either with or without rupture of the appendix; (4) cases in which the inflammation has attacked the general peritoneum; (5) cases in which general peritonitis exists with or without pus; (6) cases in which the general peritonitis has subsided and a local abscess exists, usually in the

right iliac fossa or in the pelvis; (7) cases in which nothing remains but a local process, sometimes with and sometimes without pus. As a rule it is safest to operate when general peritonitis is not present. It is always advisable to evacuate pus in late operations. The only question regarding the interval operation is as to whether the patient should be operated on after he has safely passed through his first and only attack. If there is no doubt that the appendix was inflamed, and especially if symptoms remain, operation is indicated. If the symptoms are mild and clear up after the attack, it is best to await symptoms of a second attack before operation. In the meantime the patient should be kept under observation.

A Gouge for Submucous Operations in the Nose.—COFFIN, R. A. *Boston Medical and Surgical Journal,* vol. cliv, No. 8, p. 217, Feb. 22, 1906.

This instrument will be found especially useful in removing cartilaginous and bony thickenings of the septum. The instrument is five inches in length, the guard (*a*) three-eighths of an inch, and the sharpened edge (*b*) five-

sixteenths of an inch in length. The breadth of the instrument is five-sixteenths of an inch. The guard overlaps the cutting edge a little more than one-sixteenth of an inch. The guard is blunt and well rounded, which makes it impossible to injure the mucous membrane. The instrument was originally designed to reduce flat anterior cartilaginous thickenings. It has been found useful in the bony thickenings of the vomer. In doing the various window resections there is often a thickening at the most prominent part of the convexity. In these cases the operation is facilitated by first using the gouge. The instrument is useful in removing turbinates, and will be found safe for the general practitioner, whose opportunities for using such an instrument may be infrequent.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Placenta Previa: A Series of Ninety-four Cases.—WARREN, R. *Lancet,* vol. clxx, No. 5 of vol. i, p. 276, Feb. 3, 1906.

This is a discussion of the clinical aspects of placenta previa with special reference to treatment. Of the 94 cases six mothers died, and 49 of the infants. An early diagnosis in this condition is most important. In a few cases in which the patients have thin abdominal walls the place at which the placenta is implanted can be determined before the finger can traverse the contracted cervix. Flooding may occur from a low implantation of the placenta, which may not be perceptible to the fingers until they penetrate a considerable way inside the os uteri. Two of the cases cited were examples of concealed hemorrhage, the blood stripping the membranes from the uterus until the os uteri was reached, when the flooding was manifest externally. Abdominal palpation and bimanual examination before the os admits a finger may prove of service in distinguishing between flooding due to lower implantation of the placenta or unavoidable hemorrhage and that occurring when the placenta is situated above that zone. In stout patients it may be necessary to introduce the hand into the vagina and a finger into the uterus before the presence or absence of the placenta on the lower zone can be ascertained. In a case of rupture of the uterus, the history of labor advancing to the second stage without flooding, the sudden hemorrhage and disproportionate collapse of the patient and a bimanual examination revealing recession of the presenting parts, and probably the fetus and uterus lying separate to some extent, should make the condition clear. Some

cases have been reported in which rupture of the uterus occurred as a complication of placenta previa.

The most important factor in the prognosis of these cases is early treatment, direct pressure on the bleeding points being the most efficient. There are certain conditions which cannot be controlled by the medical attendant that influence prognosis. The maternal death-rate rises with the prolongation of pregnancy. The extent to which the placenta encroaches on the lower uterine segment is of moment in the prognosis. A most important factor is the condition of the patient at the time treatment is commenced. In 45 cases the os uteri would admit three fingers or less; only two of these died. In six cases the os was from a half to fully dilated, and of these two died. This shows the prime importance of early diagnosis and treatment, as the mortality rises rapidly the further advanced labor is at the time treatment is begun. This is probably due to the greater amount of flooding and consequent collapse before help arrives.

The treatment which should be employed in these cases is that which arrests hemorrhage at the earliest possible moment, and the only certain means of doing this is by pressure on the bleeding points. The progress and completion of labor, though they may assist in stopping hemorrhage and ultimately do stop it, are secondary matters. Primary treatment is not directly concerned in expediting labor except in the slighter cases, although the methods do so incidentally. In a fair number of lateral and marginal, very rarely in central, implantation the flooding may be trifling, and slight treatment will alone be needed. A placenta implanted on the lower segment may at any time cause flooding, especially if the placenta becomes partially separated when labor pains cease. It is important even in trivial cases to watch carefully, or if time is lacking measures should be taken so that flooding cannot occur. In cases of antepartum hemorrhage in which the os will not admit a finger the position of the placenta should be ascertained. If found attached to the lower segment labor should be at once induced. The os should be dilated so as to admit of the employment of a bag. When the os is of suitable size a bag is inserted or bipolar version is performed, the former being somewhat easier in its technique. This constitutes the immediate treatment, since slight traction on the stalk of the bag or on the leg of the fetus effectively stays further hemorrhage and delivery can be awaited. It is of no importance whether the bag is pushed through the placenta, the membranes, or between the uterus and placenta. After the bag is delivered, unless the head or breech is driven down by a strong pain, internal version is the best course, since flooding occurred in several cases after the bag was expelled. In these cases the insertion of the arm for version acts as a plug until the fetus is turned and can in its turn act as a plug. As a general rule the forceps is to be avoided in cases of placenta previa.

If the os be considerably dilated when the case is first seen internal version or bringing down a leg in the pelvic presentation is indicated. Inserting the bag will only increase the amount of manipulation without corresponding advantage. The high mortality of cases suitable for this plan of treatment is due to the fact that so many of them are in a dangerous condition when first seen. Having checked the hemorrhage it is most important to keep up the patient's strength. In severe cases the quickest method is by raising the foot of the bed; next in rapidity of action is intravenous infusion of saline solution. This procedure is simple enough in the hospital or in the homes of the better class, but in the houses of the very poor it may be difficult to carry out. In such

cases normal saline solution given by the rectum is of great service. Often from four to six pints may be given in this way in from one to two hours without discomfort. The weak point in this method is that it cannot be used till labor is complete, while intravenous or subcutaneous infusion can be used as soon as hemorrhage is controlled.

Amaurotic Family Idiocy.—

QUACKENBOSS, A. *Boston Medical and Surgical Journal,* vol. cliv, No. 9, p. 238, March 1, 1906.

This disease was first described in 1881, since which time a number of cases have been reported, but only one so far as the writer is aware in the vicinity of Boston.

The first case occurred in a boy aged 14 months. The family history was good, two brothers and two sisters living and well. One child died of brain trouble at the age of 14 months. The patient was apparently normal at birth and continued well for four or five months; then the mother noticed that it appeared different from the other children, did not seem to gain in strength, was unable to sit up or hold the head, and the arms and legs were moved in an aimless manner. At times the child cried stupidly and did not appear to see well. At 13 months convulsions began. At the time that the child came under observation, it was well developed and nutrition was good. It was unable to sit up or hold the head erect. The extremities were flabby and showed a marked loss of power. The knee-jerks were normal; heart, lungs, and ears negative. There was the characteristic grayish-white patch in the macula, in the center of which was a sharply defined red spot. There was optic atrophy. Death took place at the age of 22 months, and there was no autopsy.

A second case was seen in the Massachusetts Eye and Ear Infirmary, the patient being 14 months old. The eyes in this case showed the characteristic changes in the macular region, and there was optic atrophy. This patient died at the age of two years.

A third case was a patient in the Infants' Hospital, a girl 19 months old. This was the first child born in this family. It had been breast-fed for 14 months, and developed normally until three months of age. The child never tried to walk or stand, and is unable to sit upright. The head cannot be held. Three weeks before coming under observation the child began to have twitching of the face and convulsions; since then has not taken food well. There were no marked nervous symptoms, and lumbar puncture was negative. There was optic atrophy, myopia, and the characteristic changes in the macular region. This child was under observation for about six weeks, and aside from the convulsions it was noted that there was difficulty in feeding and hypersensitiveness to noises.

A fourth case was a patient aged 18 months, a first child. The family history was negative. The patient was breast-fed for 8½ months, and developed normally until the third or fourth month, after which it grew slowly. At eight months it was noted that the mentality was sluggish. It has never sat up or attempted to stand or walk. The child was underdeveloped, with flabby skin, and was unable to hold the head; the fontanel was rather depressed. The cervical glands were enlarged, there was an absence of rickets, and no evident paralysis of face or extremities. There was extension of the legs, but after the rigidity was overcome they were flaccid. The knee-jerks could not be tested satisfactorily. Lumbar puncture and other findings negative. There was a grayish-white patch with a brownish-red center in the macular region, and optic atrophy. The pupils were large, with normal reactions.

The disease often affects several members of

the same family, and it usually terminates fatally at the end of the second year. Infants are born apparently in good health and develop normally to the third or fifth month; then the muscles become weak and flabby. The baby cannot sit up or hold the head, and the mental development is arrested. The child becomes dull, stupid, and idiotic; twitching of the face and extremities, together with convulsions, are common symptoms. There may be difficulty in feeding. The reflexes may be increased or in some cases absent. The eye disorder is not congenital, but comes on with the general symptoms, when it is noted that the child does not see well or that it rolls the eyes about aimlessly. The first thing observed in the fundus is a haziness in the macular region, which develops into the typical grayish patch with a cherry-red spot in the center. This is followed by optic atrophy. Nystagmus has been observed. When the disease was first described attention was devoted to the ophthalmoscopic appearances. Sachs was the first to point out that there was extensive disease of the central nervous system, which he at first thought was due to an arrest of development, but he now believes that it is a true degeneration.

Food Fever in Children.—

SMITH, E. *British Medical Journal,* No. 2354, p. 307, Feb. 10, 1906.

Under the term food fever the writer describes a class of cases in which the fever comes on suddenly, with more or less pronounced digestive disturbance, and lasts in its acute form for several days, or it may linger in a modified degree for some weeks. The attacks may occur quite frequently, and if so they will markedly interfere with nutrition. The subjects of this complaint are usually neurotic children from 3 to 12 years of age. The attack begins with headache, accompanied sometimes by vomiting, sometimes by looseness of the bowels, but always by some kind of digestive disturbance. The temperature varies from 101° to 105°; as a rule the stomach resonance is higher than normal, and the liver can be felt one or two fingerbreadths below the costal margin. The urine is highly colored, thick, and very acid. If the case is left alone the temperature remains for some days continuously higher than the normal level. It generally rises a little after food, and is almost always 102° or more in the evening. At the end of a few days it subsides, either suddenly after a profuse sweat or gradually, but is often moderately raised for a week or even longer. If when the fever begins the child is given calomel or blue pill the temperature as a rule falls directly the medicine has acted, but instead of remaining low it rises again in a few hours, and in the evening generally reaches 100° or a little higher. For several days the temperature at some time during the twenty-four hours will be above normal. As a rule there is no bodily discomfort, but the patients are fretful and irritable during the day and sleep badly at night.

It is probable that these cases are due to an autointoxication. The stools show fermentation, and the results of treatment are such as to suggest that this is the probable explanation. To prevent and cut short the attacks special attention should be devoted to eliminating foods which cause fermentation. Starches and sweets must be given with caution, and the ordinary combination of starches and milk forming the usual puddings of the nursery should be strictly forbidden. Milk itself, except in limited quantities, is harmful, and a milk diet which consists of milk in conjunction with various kinds of farinaceous foods is actively injurious. The proper diet should be mutton, poultry, white fish well boiled, green vegetables, and eggs. Plenty of butter should be given, with stale bread, toast, and rusks.

The salted foods are good, and patients who are old enough can take ham and tongue, bloaters, and sardines. These things, which are usually unknown in the nursery, are quite harmless and make good substitutes for marmalade and jam. Cases treated in this way quickly have a return of normal temperature, but the dieting must be strict.

Gonococcus Vaginitis in Little Girls.—

TRENWITH, W. D. *New York Medical Journal,* vol. lxxxiii, No. 5, p. 240, Feb. 3, 1906.

A careful study of twelve cases of gonorrheal infection in children is given. The method of infection in each case was carefully studied, and no case is reported that did not attend a sufficient time to determine the results. All of them were cured with the exception of one patient, who was eight months under treatment, and at the end of that time there was still a slight discharge which showed the gonococcus. The following method of treatment was carried out. Nine of the patients were below five years of age, one was ten years, another seven and one-half, and a third six years old. The mother of each patient was provided with a soft-rubber catheter not larger than No. 15 French. She was told to boil it from five to ten minutes before and after use. With the aid of a medicine dropper the catheter was attached to the tube of a fountain syringe which would hold two quarts. The douches were given with the bag elevated about three feet, and the child reclining on a douche pad with thighs flexed and abducted to the fullest extent. The catheter was then introduced and the full amount of solution allowed to flow. The douches were given from one to three times a day, according to the severity of the case. The solution employed was approximately 1 in 4000 of potassium permanganate. The stock solution given to patients was 1 in 100. Six ounces of this added to two quarts of water gives a solution of the approximate strength of 1 in 4000. After the discharge became slight in amount and mucoid in character, douches of zinc sulphate and alum one drachm to a pint of water were given morning and evening. What really seems to count is the frequent douching of the part with large amounts of the solution: the accumulated mass of infectious material is thus mechanically washed away.

The earlier the treatment is begun after the infection the better the results. The long, hard cases were those brought for treatment after the lapse of some time. After the discharge had become slight and the child was using the zinc and alum douches, solutions of silver nitrate of varying strengths were used at the clinic. In only two cases was the urethra involved, and these were treated by the application of a 10-per-cent solution of nitrate of silver. The external genitals were kept clean and dusted with talcum powder and boric acid. A dressing of bleached gauze is used, which should be thrown away as soon as it is soiled. The greatest care should be exercised in keeping cases of gonococcus vaginitis out of the day nurseries and babies' hospitals because of its epidemic character.

Fatal Rupture of a Pyosalpinx During Labor.—

ROB, J. W. *Lancet,* vol. clxx, No. 6 of vol. i, p. 365, Feb. 10, 1906.

The case described occurred in a healthy, vigorous woman who had been in labor for some time before coming under observation. At the time she was seen the head was at the brim of the pelvis and the os fully dilated. The pains being feeble, chloroform was administered and forceps applied, the delivery being accomplished with only a slight tear of the perineum, which was sewn up. Thirty-six hours after the labor there were no untoward symptoms. The abdomen was not rigid nor distended, and the uterus could be easily felt. The temperature was 100° and the pulse 96.

About forty-eight hours after labor there was some colicky pain in the abdomen, but no tenderness. The temperature was then 99.6° and the pulse 96. Five hours later the temperature was 100° and the pulse 100. The following morning she was much worse, vomited repeatedly, and complained of intense abdominal pain. The temperature at this time was 98° and the pulse 140. The abdomen was not rigid or distended. There was slight tenderness on the left side of the uterus. Two hours later the patient expired.

A post-mortem examination revealed an ounce of blood-stained serum in the pericardium and in each pleural cavity. The lungs, heart, brain, spleen, liver, and kidneys were healthy. The small intestines were hyperemic in places. About the left ovary and in Douglas's pouch and in the lesser sac of the perineum was some flaky lymph. There were several old adhesions around the left ovary and Fallopian tube, both of which were deeply congested. A drop of thick yellow pus escaped from the left Fallopian tube, which contained about half a drachm of the same material. The interior of the uterus was quite healthy. There was no history of salpingo-oöphoritis.

Congenital Occlusion of the Ileum.—

EDINGTON, G. H. *British Journal of Children's Diseases,* vol. iii, No. 2, p. 53, February, 1906.

This rare condition was noted in a child four and a half days after birth. There had been no movement of the bowels since birth. The abdomen was distended and slightly tympanitic. The anus was well formed, and the canal admitted the little finger for a distance of two inches, at which point it seemed to end in a cul-de-sac. An elastic catheter could not be passed further than 2½ inches. The pelvis was explored through a median incision in the perineum. No dilated intestine could be felt, but a firm cord was found, which was also detected from above after the abdomen was opened. Through the higher incision the distended intestine was opened and sutured to the parietal peritoneum. Through the incision in the gut the finger was passed downward into a large sac above the pelvis, which had no communication with the rectum. Thirteen days after the operation the child died. At the post-mortem examination it was found that what was taken for the sigmoid flexure was really a portion of the ileum. The alimentary canal was interrupted at a point three feet seven inches from the pylorus, the bowel ending in a blind sac. This sac was connected by a layer of mesentery with the upper end of the lower segment of the bowel. Such cases may be divided into two groups: the first depend on abnormal obliteration of the vitelline duct, and the second on antenatal peritonitis.

Scarlatinal Nephritis.—

LOWENBURG, H. *Journal of the American Medical Association,* vol. xlvi, No. 7, p. 503, Feb. 17, 1906.

In scarlet fever the function of the skin is greatly impaired, thus overtaxing the kidneys. In the disease there is a toxemia which in itself may produce kidney disorder without the usual clinical manifestations of scarlatina. Constipation and exposure to cold are important contributing factors, the last especially in susceptible and anemic patients. To prevent scarlatinal nephritis good ventilation should be insisted on, and a constant, carefully regulated temperature of from 68° to 70° F. A milk diet should be employed, varied toward the close of the disease by the addition of vegetables, fruits, and farinaceous substances. Fruit juices are refreshing and lessen urinary acidity. There should be a daily examination of the urine, especially after each change of diet. The appearance of albumin should be the signal for a return to an absolute milk diet. Water should be given freely, as it aids in the elimination of toxins, and its administration should be as regular as the food. If plain water can-

not readily be taken some of the mineral waters may be used, or better lemonade or orangeade, to each pint of which a teaspoonful of cream of tartar may be added. A daily bath with friction is a valuable adjunct in promoting the skin functions, and its temperature should never be lower than 8 or 10 degrees below that of the patient. Saline solutions may be given by the bowel, using from 1 to 8 ounces for each enema twice a day. The only drugs of value in preventing renal complications are alkalies and laxatives. Minute doses of calomel should be given at intervals of three or four days during the disease, followed by broken doses of magnesium sulphate.

Infantile Pseudoleukemic Anemia.—

HUNT, J. G. *Journal of the American Medical Association,* vol. xlvi, No. 5, p. 334, Feb. 3, 1906.

A case of this disease occurring in a child fifteen months old is reported. The cause of the disease is not clear, though rickets, chronic intestinal catarrh, syphilis, and tuberculosis may be regarded as causative factors. The principal points by which it is differentiated from somewhat similar conditions are the early age at which it appears, patients being usually from one to four years old, the enlarged spleen, and the relatively favorable prognosis. The blood has a lower hemoglobin ratio. The red cells are decreased, but not so much as in pernicious anemia. The variations in the nucleated cells, though marked, are not distinctive features of this disorder. The significance of the tissue changes has not been definitely determined, but they are rather characteristic. The absence of iron deposits in the liver cells and of the characteristic nodules in the organs is sufficient to distinguish these cases from pernicious anemia or leukemia. There is a striking likeness in this disease to the ordinary severe forms of malnutrition. This was so marked in Hunt's case that only the blood examination revealed the true state of affairs. A study of the blood is most important, as the prognosis depends largely on the early diagnosis and proper treatment. In neglected cases the outlook is grave. Arsenic is the best remedy, and associated with its administration should be close attention to hygiene and nutrition.

Foreign Bodies in the Uterus.—

HELLIER, J. B. *Practitioner,* vol. lxxvi, No. 2, p. 169, February, 1906.

The case of a woman is described from whose uterus a hairpin was removed. The writer takes occasion to discuss generally foreign bodies in the uterus, which are classified according to the reason for introduction. About half the total number were probably or certainly introduced to procure abortion. The next in number are those inserted for therapeutic purposes, such as leeches, tents, and pessaries. Vaginal pessaries show a singular capacity for migrating into the uterus. Attempts to prevent conception, self-abuse, and the vagaries of the insane and hysterical account for the remainder.

One of the most striking cases of migration of a foreign body from the vagina to the uterus is reported by Czarnecki. A girl 12 years of age at the onset of menstruation, alarmed by the flow of blood, introduced a tin box into the vagina. It was 10 centimeters in length, 4 centimeters in diameter, and oval in outline. After this menstruation was regular, and she subsequently could feel the box in the vagina. There were practically no symptoms, and she never sought advice or told any one about it. She married at 25, and her husband is said to have not found anything amiss. Five months after marriage she became pregnant, but aborted at four months, not having medical attendance. After the abortion the foreign body was no longer felt in the vagina. A

second pregnancy went to term. When labor began the foreign body was found lying between the head of the fetus and the os. The tin box was first crushed and then removed, delivery being completed without much difficulty, the child and mother doing well.

The Importance of a Strictly Limited Lactation.— FORDYCE, A. D. *Lancet,* vol. clxx, No. 4 of vol. i, p. 221, Jan. 27, 1906.

The writer has studied the relation of pregnancy, menstruation, and lactation in 100 mothers who had borne 405 children. As a result of this investigation he comes to the conclusion that the concurrence of pregnancy with lactation is quite frequent. Conception is rare in the first six months of lactation and uncommon before the eighth month. Where pregnancy and lactation overlap the fetus is likely to suffer. While the necessity of maternal nursing is imperative it is equally important that the period of lactation should be strictly limited. While individual conditions will vary the general rule should be that in healthy infants weaning should take place at the eighth month.

FORENSIC MEDICINE.

An Extended Litigation for Fees.— *Journal of the American Medical Association,* vol. xlvi, No. 10. p. 751, March 10, 1906.

The litigation in this case began March 4, 1896. A physician recovered $160 in a justice court for services rendered. The case was then appealed to a court of record, where it was retried and judgment rendered for a like amount. From this judgment there was an appeal, upon which the judgment was reversed and the case remanded. A second trial in the court of record resulted in a verdict for $50, which was appealed to the Supreme Court of Missouri, where the judgment for $50 was affirmed. The plaintiff was a practicing physician, making a specialty of diseases of the nose, throat, and ear. He had treated the defendant in 1890, his bill for that service having been paid. In 1892 he again applied for treatment, the trouble being quite different from that treated two years before. He was suffering from inflammation of the turbinate bone and of the frontal sinus. It was hoped to relieve him without an operation, and there was no guarantee that a cure would be effected. It appeared that the defendant was benefited, that the case grew better, and that the treatment relieved the congestion leading to the sinus. From time to time the defendant would catch cold and violently blow his nose, thus keeping up the inflammation and tending to close the connection between the sinus and nasal cavity. The propriety and correctness of the treatment was supported by several physicians, and the defendant's own experts testified that the practice was correct. The defendant himself did not claim to be injured by the treatment, but he said that he was not benefited.

Among the instructions given on behalf of the plaintiff was that if the jury found from the evidence that the plaintiff had rendered the services to the defendant and at his request, and that no price was fixed or agreed upon, then there was an implied promise from the defendant to pay for such services what the same were reasonably worth, and that this was true without regard to whether the treatment was beneficial or not. Other instructions qualified the words "reasonably worth" by adding "according to the usual charges of the medical profession in the vicinity." The jury was instructed that if the plaintiff knew that the disease from which the defendant was suffering was in the frontal sinus, and the plaintiff had reasonable cause to believe in the exercise of ordinary care and skill that the same would yield to treatment without an operation, then

he had the right to treat the defendant for such trouble until such time as he became reasonably certain it was necessary to perform such operation.

The jury was instructed on behalf of the defendant that he had a right to expect good faith from the plaintiff and to rely upon his supposed superior knowledge. If the treatment sued for was worthless, or if the plaintiff then knew or ought, because of his professional knowledge and skill, to have known of the uncertainty of the treatment and he failed to inform the plaintiff of it, the verdict should be for the defendant. The plaintiff had no right even in the best faith to render services of no substantial benefit to the defendant and charge therefor. If he himself had doubt, or as a reasonably prudent and competent physician ought to have had doubt, of such service being a successful treatment of the defendant's trouble unless he fully informed the defendant of such doubt; if the trouble with which the defendant was suffering and for which he sought the plaintiff's professional aid was in the frontal sinus, and an operation was then necessary to relieve the trouble, and the plaintiff knew this or could have known it by the exercise of reasonable skill and effort, then his treatment of the plaintiff was unskilful and he ought not to recover. The plaintiff could not recover for the service rendered in this case merely because he may have performed such service with the permission or even at the request of the defendant, and avoided giving the defendant an express guarantee of a cure.

Injurious Substances in Bottles.—

Journal of the American Medical Association, vol. xlvi, No. 8, p. 614, Feb. 24, 1906.

At a time when the patent medicine and nostrum evil is attracting a good deal of attention a review of the status of injurious substances in bottles is of importance. The Supreme Court of Georgia held in the case of Watson *vs.* Augusta Brewing Co. that the manufacturer was negligent in allowing foreign substances to be contained in them—in this case bits of broken glass, some of which were swallowed. An operation was undertaken and the glass removed from the stomach. The court says that the decision is supported by a former case (Blood Balm Co. *vs.* Cooper, 83 Georgia, page 457), though the latter differs in some particulars. The composition of patent or proprietary medicine is usually shrouded in mystery, and it is generally understood that such remedies contain ingredients which if taken in sufficient quantities will produce injurious results. It was held that one who buys a patent medicine could rely on the obligation of the manufacturer not to place therein ingredients which if taken in the prescribed doses will injure the health.

In the case at bar the purchaser bought an alleged harmless and refreshing beverage, and had the right to rest secure in the assumption that he would not be fed on broken glass. On the question of whether or not the plaintiff in this case could recover for mental suffering growing out of his injury, and if so, to what extent, the court says that it is a principle that where physical injury has been sustained the injured may recover for mental suffering caused by or growing out of his bodily hurt. One may not recover for mental suffering which is not reasonable or which is merely fanciful. It can hardly be disputed that a reasonable fear of death constitutes mental suffering of a keen sort. It is not unreasonable for one who has swallowed several pieces of glass to entertain a very vivid apprehension of an untimely end, and the mental anguish caused by this dread may constitute an element of damage. After the glass had been removed from the stomach and the person was apparently restored to his former condition his fear

so far as a damage suit is concerned should cease. He may not continue for an indefinite period to vex his soul with dread on account of having been "cut on the inside," and hold the defendant liable for his apprehensions.

Camphor Poisoning.—

RHODES, O. M. *Illinois Medical Journal*, vol. ix, No. 1, p. 76, January, 1906.

A number of cases of camphor poisoning have been reported recently. Camphor does not seem to be especially toxic, and yet certain patients seem to react to comparatively small doses. The case reported by Rhodes is estimated to have taken about 15 grains of camphor. The solution contained two ounces of gum camphor dissolved in one pint of alcohol. The dose was not measured by the patient, hence it may have been somewhat greater than 15 grains. According to Potter as much as 200 grains of camphor have been taken without fatal results. Six or seven grains have produced drowsiness and weakness of the pulse. Rhodes's patient was seen within one-half hour after the dose was taken. At the time he was sitting in a chair, was afraid to lie down, and was unable to stand. The respirations were 60 to 70 in the minute, and the pulse 130 and weak, but regular. There was an anxious expression, and the face was pale, lips cyanotic, pupils normal and equally dilated, cold perspiration on forehead, and face and extremities cold and trembling. The patient was conscious, but unable to speak above a whisper, and could only utter a few words with difficulty. Under strychnine and nitroglycerin the difficulty in breathing ceased, but it was soon followed by another attack, which was accompanied by a peculiar wave-like feeling which seemed to start at the feet, gradually extending toward the top of the head. There was a feeling as though the top of the head were being lifted off, or as though he were swinging in the air. Marked dyspnea accompanied each of these wave-like attacks, which increased in frequency, duration, and severity until the nitroglycerin and strychnine were administered. Warm salt water was given, which brought up some of the camphor. Improvement was rapid, the patient being out of danger in an hour, and aside from slight dyspnea for a day or so there were no subsequent symptoms. This patient had been in the habit of taking teaspoonful doses of the solution at quite frequent intervals and with no ill effects. It would appear from this that camphor does not produce toleration.

Potassium Permanganate Poisoning.—

SHOEMAKER, J. V. *Medical Bulletin*, vol. xxviii, No. 2, p. 41, February, 1906.

Poisoning with permanganate of potassium is comparatively rare. The extended use of this substance as a local application will lead to more frequent cases. The case reported by the writer is one in which the solution was mistaken for a glass of wine, and the amount taken contained about 40 grains of the crystals. The mistake was at once discovered, and voluntary efforts at vomiting were instituted, which brought up a considerable amount of that which had been swallowed. The patient was at once sent to the hospital, and was admitted in a semicomatose condition with slight delirium, having the general appearance of one in shock. The skin was pale, cold, and clammy, the respirations shallow, and the heart sounds weak; the pulse was feeble and irregular. A hot rectal injection was given and hypodermics of strychnine. The white of egg and milk were administered by the mouth. At the end of fifteen hours the patient was comfortable, the circulation was normal, and there was no pain. For five days the diet of milk and albumen was continued, and she was then given soft food.

B. J. C. D

PUBLIC HEALTH.

Extermination of the Mosquito.—

Doty, A. H. *American Journal of the Medical Sciences,* vol. cxxxi, No. 2, p. 187, February, 1906.

In our February issue we gave an abstract of Ross's article on the dissemination of the mosquito and the value of local efforts at extermination. Doty says that we are now familiar with every variety of mosquito that propagates in the United States. The stegomyia is responsible for yellow fever and the anopheles for malarial fever, and thus far there is no evidence that other mosquitoes act as a medium of infection. The latter is found throughout the United States, and the former only in its southern portion. This accounts for the fact that yellow fever has been confined to the Southern States. *Culex sollicitans,* commonly known as the salt-water mosquito, constitutes about 80 per cent of the mosquitoes found along the Atlantic coast, and is the chief source of annoyance in that region. Extermination of the mosquito is not only practical but can be successfully accomplished. All varieties of the mosquito propagate only in water, and all deposit their eggs on the surface of the water, with the exception of sollicitans. From the deposit of the eggs to the development of the winged insect requires a period of from twelve to twenty-five days. The sollicitans deposits its eggs on the ground in the salt marshes along the coast, though the development of the eggs does not take place until the earth is covered with water. In the salt marshes this is supplied by the frequent floodings. The *Culex pungens* is the most common variety in the United States. It will breed in almost any receptacle containing water, but its most active breeding ground is in stagnant and offensive water. The anopheles, while it may sometimes be found breeding in the same receptacle as the *Culex pungens,* generally selects for its breeding place small pools, commonly permanent ones, which are not contaminated. The water may be frequently covered with green scum, or water contained in small ground depressions along the edge of swamps, or pools of water which are fed by springs or in unused receptacles about the house. The sollicitans will breed only in salt water. The dried soil containing the eggs of the sollicitans may be kept for months, and upon moistening the larvæ will appear. The *Culex pungens,* or inland mosquito, is perpetuated by hibernation of the winged insect itself and not by its eggs. When the warm weather appears the survivors become active and deposit their eggs in receptacles containing water.

A general impression exists that the life of a mosquito is very short, probably a few days only. This is erroneous. While it is not a resistant insect in the hibernating stage, it may live from fall until the following spring. In its active state in warm weather it may live a number of weeks. Excluded from air and light it does not live very long, and it is probable that the disinfection of baggage is unnecessary coming from a place more than two days' distant. Sollicitans is sometimes found a long way from home, but *Culex pungens,* anopheles, and the stegomyia are domestic mosquitoes, and remain in close proximity to a breeding place unless forcibly removed by winds or other means. The contrary opinion has been formed probably from overlooking the local breeding places. A small receptacle will breed a large number, and careful examination should be made of premises for breeding places before looking elsewhere for them. Such breeding places are frequently found in the most unexpected places. As an example of this the writer mentions an instance in which a number of cases of malarial fever occurred in two or three houses in close proximity. The anopheles was found in the rooms of these dwellings during the evening. In the immedi-

ate vicinity of the houses were found numerous pools of water, rain-water barrels and other receptacles, which were examined with great care, but no anopheles larvæ were found. Finally in the garden of a vacant house adjoining those where malarial fever existed was found an old cake-pan almost entirely covered with long grass, but filled with anopheles larvæ. An ordinary inspection would probably have overlooked this receptacle.

In exterminating mosquitoes the different habits of the various varieties must be taken into consideration. The sollicitans can only be exterminated by the drainage of salt-water swamp lands. The use of oil in the extermination of this variety of mosquito even as a temporary measure is of little or no value. In inland districts which are infected with *Culex pungens* and other fresh-water or inland mosquitoes drainage and filling in of depressions which are likely to hold water should be employed. Especial attention should be directed to all water containers which may act as breeding places. Cisterns and rain-water barrels contribute largely to the propagation, and these must be done away with or supplied with tight-fitting covers properly screened so as to admit the air. If ground depressions either about the premises or in the neighborhood cannot be drained or filled in, they may be oiled. Crude petroleum should be used, in the proportion of one pint to a water surface of about twenty feet.

The Teachers' Part in the Tuberculosis Problem.— KNOPF, S. A. *Medical Record,* vol. lxix, No. 7, p. 245, Feb. 17, 1906.

Attention is called to the aid which schoolteachers may give in preventing the spread of tuberculosis. Pupils should be taught the importance of fresh air, and ventilation of classrooms should be ample. Where the site of the schoolhouse does not permit of large playgrounds, a roof garden which can be covered in winter is necessary. The heating and general ventilation of schoolrooms should be of the most approved kind, and French windows should be generally employed. The walls and woodwork of the schoolroom should be plain and easily cleansed. All corners should be rounded and the walls painted. The school furniture should be so arranged that it can be easily moved and the floors thoroughly cleansed. A well equipped gymnasium and a swimming tank with running water suitably warmed should be a part of every public school. Every pupil should be taught to swim, and should be given the opportunity to bathe several times during the week. Teachers may do much toward the prevention of tuberculosis by teaching children how to breathe, sit, stand, and walk properly. The teacher should put into the hands of children a leaflet containing the following rules, which should be frequently read and commented on by the teacher:

Do not spit, except in a spittoon or a piece of cloth or a handkerchief used for that purpose alone. On your return home have the cloth burned, or the handkerchief put in water until ready for the wash.

Never spit on a slate, floor, sidewalk, or playground.

Do not put your finger in your mouth.

Do not pick your nose or wipe it on your hand or sleeve.

Do not wet your finger in your mouth when turning the leaves of books.

Do not put pencils into your mouth or wet them with your lips.

Do not hold money in your mouth.

Do not put pins in your mouth.

Do not put anything into your mouth except food and drink.

Do not swap apple cores, candy, chewing gum, half-eaten food, whistles, bean-blowers, or anything that is put in the mouth.

Peel or wash your fruit before eating it.

Never cough or sneeze in a person's face. Turn your face to one side and hold a handkerchief before your mouth.

Keep your face and hands and finger-nails clean; wash your hands with soap and water before each meal.

When you don't feel well, have cut yourself, or have been hurt by others, do not be afraid to report to the teacher.

Proper feeding is an important matter in preventing the spread of tuberculosis in school-children, and school lunches should be furnished by the school authorities at moderate price. There is great danger in alcoholic drinks, including the patent medicines which are in such common use among the masses. The school-teacher should be familiar with the subjective signs and symptoms of tuberculosis, and the characteristics of those predisposed to consumption. Both the tuberculous teacher and children should be taken out of the public schools and provided for at seaside and inland sanatoria.

Sanitary Importance of Clean Milk.—

HARRINGTON, C. *Boston Medical and Surgical Journal,* vol. cliv, No. 5, p. 121, Feb. 1, 1906.

In discussing the high mortality among infants during the first year the writer asks the pertinent question, What value has a higher birth-rate if infant life is not conserved? The most important cause of mortality in infants is artificial feeding. The difference between cow's milk and human milk is of minor importance. The real cause of the mortality is the fact that market milk is almost everywhere a dirty food. It contains a large number of bacteria. The majority of cow stables are so filthy that they are unfit places for the production of milk. Under ordinary circumstances pollution of milk begins before the operation of milking is fairly under way. It is estimated by Warington that a single gramme of cow's manure contains 165,000,000 bacteria. It will be seen how effectually in dirty milking the milk will be contaminated. These germs fall into a rich culture medium and reproduce rapidly. The purchaser knows nothing of the care which the milk gets before it reaches him, and he takes it for granted that the nice glass bottle in which it is delivered in the morning is a fair index of the manner in which the milk has been gathered. Dirty milk is most deadly in very young infants, but it is the cause of many diseases in those under five years of age. It is most important that the invalid and convalescent should have a clean milk. The remedy is in educating the public to a proper appreciation of a clean milk supply. They should be taught that a clean milk costs more than a dirty milk. In addition public health authorities should everywhere investigate and study the conditions under which milk is produced and distributed.

The Budde Process for the Preservation of Milk.—

HEWLETT, R. T. *Lancet,* vol. clxx, No. 4 of vol. i, p. 209, Jan. 27, 1906.

The writer has made an experimental investigation of the Budde method of treating milk. The process was invented by a Danish engineer, and is now extensively used in Denmark and Sweden. In the countries named seventeen creameries and dairies have installed plants for Buddeizing and bottling milk. The milk to be subjected to this process is obtained in as cleanly a condition as possible, and if it has to be kept for any time before treatment it is sufficiently chilled. The treatment is instituted as soon as possible after milking. Peroxide of hydrogen is added to the milk, and the mixture is heated to from 51° to 52° C. for at least three hours. A temperature below 48° C. is not efficient, and one above 55° C. should be avoided as it causes changes in the milk. At this temperature the hydrogen peroxide is

decomposed into water and oxygen by an enzyme present in the milk, and the oxygen being in a nascent condition acts as an efficient germicide. At the end of the process the whole of the hydrogen peroxide has been decomposed, providing the right proportion has been added. There has been an inappreciable addition of water to the milk, and the majority of the microörganisms have been destroyed. To obtain this result about 15 cubic centimeters of a three-per-cent solution of hydrogen peroxide should be added to a liter of milk. The milk is not altered in appearance or flavor. The cream rises as usual. All non-sporing pathogenic germs are destroyed, and the milk will keep sweet for at least eight or ten days in hot weather.

Lindman in a paper before the Society of Physicians of South Sweden says that milk treated in this way causes no digestive disturbance and its nutritive qualities are unimpaired. Hewlett's experiments show that all non-spore-forming bacilli are destroyed by this process. The sporing forms were diminished but not destroyed. In all the experiments, whether the natural milk was used or sown with micro-organisms, it was found that by the heating alone, while it diminished the number of pathogenic germs, the effect was not so marked as when the peroxide was added. Milk obtained in the ordinary way without special precautions has the microörganisms reduced by the Budde process to infinitesimal proportions.

Cleansing of Milk Vessels.—

STEWART, A. H. *American Medicine,* vol. xi, No. 7, p. 241, Feb. 17, 1906.

The writer has been active in a crusade to obtain a clean milk supply for Philadelphia, and has made a thorough investigation of the usual methods of cleansing milk vessels. Many dealers neglect this important procedure, while a majority employ methods which fail to accomplish the desired results. The method recommended, which is used in a few establishments, is the employment of a hot solution of washing powder driven into the bottles by considerable force. Such a method cleanses 95 per cent of the bottles perfectly. Sodium carbonate forms the best substance for cleansing purposes, and it is cheap. From a public health standpoint the filling of dirty bottles on the street from milk wagons and the return of cans to the farm without washing are methods which should receive prompt attention. There should be a can washing and cleansing building under the charge of the health department. Such a scheme would result in a great saving of milk which is now destroyed by rapid fermentation due to infection from dirty cans.

Lead Poisoning from Electrolysis of Water Pipes.—

ROBERTS, G. A. E. *British Medical Journal,* No. 2351, Jan. 20, 1906.

A well studied case shows the possibility of electrolysis in dissolving lead from a water pipe and allowing it to be taken up by the water. An analysis of the water showed 0.14 grain of lead to the gallon. The water-supply was from a pure source, and in other situations when conducted through lead pipes was not contaminated. The lead water main was within a few inches of a cable of an electric light service, the return being an uncovered strip of copper. A leakage of 1.8 volts was discovered, and on testing the water pipe it was found to carry a current of one-tenth volt. Attention is called to the common practice of grounding telephone wires and electric bell instillations by attaching them to the water pipes of houses. The demonstration in the particular instance reported that lead poisoning was due to the electrolysis of the water pipe is conclusive. In cases of obscure lead poisoning this point would be worthy of investigation.

B. J. C. D.

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EDITORIAL.

RECENT RESEARCHES ON RELAPSING FEVER.

Relapsing fever has been known since the early part of the eighteenth century. It seems to be a common disease of India, whence it has frequently extended into Europe. Upon a number of occasions it has made an unexplained appearance in the United States. Thus it occurred in the Philadelphia Hospital in 1844. Flint saw three cases of it in 1850 and 1851, and in 1869 an extensive epidemic occurred in New York and Philadelphia. Occasionally sporadic cases have been observed since that time in England, Ireland, and Wales. Several epidemics have occurred in the Philippine Islands, and more than a thousand cases occurring in Bosnia afforded an excellent opportunity for a research into its etiology by Karlinski.

With the opening up of the various colonies of the different European nations in Africa a fever resembling, and perhaps identical with, the Asiatic and European relapsing fever soon made itself known, and eventually became a serious menace to colonization.

In 1873 Obermeier discovered in the blood a spiral organism, now known as Spirochaeta Obermeieri, which is present in all cases during the febrile paroxysms. This organism, now well known, has invariably refused to grow in artificial culture media of any kind. Its specific nature has been abundantly proved by Moczutkovski, who produced the disease in human beings by experimental inoculation, and by Carter, Koch, and others, who found that it was capable of infecting apes. More recently it has been discovered that numerous smaller animals such as rats are susceptible to it. The inability of the microörganism to grow in artificial culture media, and transmit the disease from individual to individual by a close contact, early suggested that the transmission of the parasite was brought about through some intermediate insect host. Tiktin, in 1897, and Karlinski (*Centr. f. Bakt.*, etc., vol. xxxi, p. 655, 1902) believed that bedbugs are the distributing hosts.

Karlinski investigated this subject in connection with an epidemic of the disease in Bosnia, where out of a thousand cases only two were found to occur among the better classes. The remainder of the victims lived under conditions scarcely known to us in this country—in small, thatched houses with earthen floors simply alive with bedbugs, lice, and fleas. Karlinski examined the stomachs of a number

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of fleas and lice, and later of one hundred and twenty bedbugs caught in houses where relapsing fever had occurred. Nothing of interest was found in the fleas or in the lice, but in the bedbugs large numbers of healthy living spirilla were found. These were capable of withstanding the digestive juice, and continued to infect the bedbugs thirty days after they had preyed upon the blood of infected individuals. This leads Karlinski to the conclusion that the bedbug is the chief distributing host of the disease.

This observation of Karlinski's is quite in keeping with our knowledge of other spirillary infections. Thus, Marchoux and Salimbeni (*Annales de l'Inst. Pasteur,* vol. xvii, p. 569, September, 1903) in investigating spirillary infection of chickens found that the infection was transmitted from one chicken to another by a tick known as the *Argas persicus.*

Relapsing fever in Africa was shown to be a spirillosis caused by a microörganism not to be differentiated from Spirochaeta Obermeieri. Four cases published by Ross and Milne (*British Medical Journal,* Feb. 26, 1904) ascribed their illness to having been bitten by ticks, and in most countries where ticks are numerous various illnesses are ascribed to their bites. Thus, natives of Central Africa, according to Christy (*British Medical Journal,* Sept. 19, 1902, p. 652), dread the horse-tick, *Ornithodoros moubata.* A similar tick, also feared, and known as the *Argas turicate,* and another, *Argas megnini,* occur in Mexico; *Argas telaje* in Central America; and *Argas chinche* in Colombia. *Argas persicus* is said to cause tick-fever in Persia. The well known fact that a tick, the *Boöphilus bovis,* is the definitive host of Texas fever of cattle, is not without significance in regard to the probable rôle of these insects. On November 26, 1904, Dutton and Todd (*British Medical Journal,* Nov. 11, 1905) announced that they had found that a spirillum was the specific agent in the causation of human tick-fever in the Congo Free State, and that they had succeeded in infecting monkeys with the disease by allowing them to be bitten by ticks—*Ornithodoros moubata.* These ticks seem to have entered the Congo Free State from the east, being carried from the east coast by Arabs and from the south by way of the Portuguese territory. F. C. Wellman (*American Medicine,* vol. x, No. 4, p. 151, July 22, 1905) points out that this tick is very common in Angola Land, is very much feared, and is known as the Ochihopio tick.

The most complete study of the subject has been made by Koch (*Berl. klin. Wochschr.,* vol. xliii, No. 7, p. 185, Feb. 12, 1906), who observed that in German East Africa relapsing fever was a very common disease, especially among those who traveled on the caravan roads and other highways, so that Europeans journeying in any direction from Zanzibar along one of these roads are almost certain to become infected, especially between Dar-es-Salan and Mrogoro. Remembering the opinions of Tiktin and Karlinski that bedbugs might act as carriers of the disease, and noting the connection between ticks and other forms of spirillosis, Koch decided to investigate the local ticks with reference to the disease. There were collected from two sections of the country a number of ticks, which were carefully dissected, and the individual organs investigated by crushing them in dilute serum and spreading upon coverglasses, staining by Giemsa's method and carefully examining with a microscope. Spirochaetæ were found in a number of ticks, but the most important, and to him most remarkable, discovery was that in some of them the microorganisms were found only in the ovaries. The particular tick in which the spirochaetæ were found was the horse-tick, or *Ornithodoros moubata.* The important dis-

covery of the spirochaetæ in the ovaries of the ticks is again in keeping with certain information that we have concerning the transmission of infection from the adult tick to its offspring in the *Boöphilus bovis,* which causes Texas fever in cattle. Here the adult female tick, having distended itself with the blood of the steer, drops to the ground and discharges a mass of eggs nearly the size of its own body. The embryo ticks are hatched from these eggs already infected with the piroplasma, and are ready to impart the disease to the first susceptible animal to which they can attach themselves. *Ornithodoros moubata,* although called the horse-tick, also preys upon human beings, and probably upon a number of other vertebrate animals. Apparently they prefer human blood, and Koch says they live exclusively upon it.

The ticks are nocturnal insects. Their daily habitat is the dry soil of the huts of the natives. If the soil is moist no ticks are found in the hut, but when it is dry there may be great numbers. They dig their way out of the soil at night, and then prey upon the natives, who sleep upon mats on the ground. In this way the ticks become infected with the spirochaetæ, and of course are able to transmit them to other individuals through their bites. It is improbable that such direct transmission takes place, and the finding of spirochaetæ in the ovaries of the tick led to an investigation of the newly hatched ticks, in order to see whether the infectious agents had been transmitted to them through the eggs. Koch was able to demonstrate that by placing a number of embryo ticks—say about a hundred—upon monkeys, which are highly susceptible to relapsing fever, he was invariably able to infect them with the disease. He was also able to demonstrate the presence of the spirochaetæ in the eggs by crushing them and spreading the contents upon a slide, where they were stained by ordinary methods.

In order to determine the infection of the ticks upon the caravan roads, an expedition was sent out for the purpose of studying them. Six hundred and forty-five ticks were caught and examined, and 71, or 11 per cent, found to be infected with the spirochaetæ. The highest percentage of infected ticks was found at Dar-es-Salan, where 17 per cent were found infected. In one hut a number of ticks were caught, of which 40 per cent were found infected. Convinced that the ticks were the cause of the disease, and that the infected ticks were to be found in the houses of the natives, the experiment was made of traveling on the caravan roads and avoiding all places of shelter frequented by the native peoples. By selecting sleeping places 20 or 30 meters removed from the settlements, and therefore from the ticks, it was found possible to avoid the infection. In this way a company consisting of two physicians and three other Europeans with fifty or sixty native porters were able to travel without the occurrence of any disease among them. In this caravan there were five men who came from the coast, where relapsing fever does not occur. In order to make the experiment more complete, these five men were allowed to sleep in the native huts, and under the shelters used ordinarily by the caravans. Four of these men took sick with relapsing fever, this being, as Koch says, as good a control test as could be wished for. The prophylaxis of the disease is quite simple, the important measure being to avoid sleeping in the huts of the natives, thus escaping infection from the ticks. The almost universal distribution of ticks in this part of Africa makes their destruction impracticable, and the fact that quinine and other drugs are known to be without effect upon the spirochaetæ makes impossible the destruction of the organisms in the blood of infected individuals.

Dutton and Todd found that the spirochaetæ stained readily by the various modifications of

Romanowsky's method, though the actual staining process varied greatly in the length of time necessary. The longest spirochaeta observed measured 43 microns, the shortest 13 microns. The organisms sometimes arranged themselves into twos, threes, and fours, and what appear division forms, inasmuch as they presented a Y-shaped outline. Their animal experiments showed that the organisms were uniformly pathogenic for monkeys (Cercopithecus). Rats, guinea-pigs, and rabbits were tried, but in none was inoculation with infected blood followed by any symptoms of constitutional disturbance.

Koch says the spirochaeta has fine, regularly twisted spiral screws which are actively motile, the movement consisting chiefly in rotation around the long axis. Not much actual progress is achieved. He noticed that the organisms in blood gradually came together, as if some chemotactic force acted upon them. Occasionally a spirochaeta is seen mingling its spiral coils with those of another organism. This does not indicate longitudinal cleavage, which of course would be expected should the opinion of Schaudinn that they are akin to the trypanosomes be accepted. Koch endeavored by every known means to confirm Schaudinn, but he was unable to demonstrate a blepharoplast, a definite nucleus, or an undulating membrane; nor was he ever able to discover an indication of longitudinal division. On the other hand, he many times observed cases in which transverse division seemed to be taking place. Professor Zettnow, to whom he showed his specimens, was also unable to discover in them any sign of relationship to the trypanosomes. He had, however, the satisfaction of making for the first time an observation upon the terminal ends of freshly divided organisms, upon which there was a short appendage, probably a flagellum.

Novy and Knapp (*Journal of the American Medical Association,* Jan. 13, 1906) were fortunate enough to obtain the spirochaeta of relapsing fever through Dr. Norris, of Bellevue Hospital in New York, when several cases were treated in 1905, and keep it alive by frequent transplantation into monkeys and white rats. They were able to keep it alive by successive passage through white rats for over two months. When the blood containing the organisms is injected into the peritoneal cavity of the rat, the parasites appear in the blood in from thirty-six to forty-eight hours after inoculation, disappear within the next twenty-four hours, and do not subsequently reappear. Rats are then immune to subsequent infection. The disappearance of the spirochaetæ was shown to be due to the formation of antibodies. Blood containing the spirochaetæ when kept *in vitro* retains its virulence for more than fifteen days. They found the blood of immune rats to have a pronounced curative effect. Rats with five to ten spirochaetæ in each field of blood observed with one-twelfth-inch objective would have the circulation cleared in one hour by the injection of immune blood. All attempts to cultivate the spirochaeta on blood agar—the method that succeeded so admirably in the case of trypanosomes—have been followed by failure. The spirochaetæ multiply by transverse division.

In discussing the position of the spirochaeta and its relation to the trypanosomes, before the American Society of Bacteriologists in December, 1905, Novy pointed out that it had affinities with both. Thus, if it is a bacterium, it is the only one known to be transmitted from animal to animal by a definite intermediate host, and certainly the only one to be transmitted through the egg to the offspring of the insect host. In distilled water it fails to undergo the rapid plasmolysis seen among trypanosomes, and behaves very much like the bacteria. The absence of undulating mem-

brane, of a well marked nucleus, and of the blepharoplast would seem to place the organism among the bacteria rather than among the protozoa. Novy believes that the organism studied by Dutton and Todd, and later by Koch, though closely related to that of European relapsing fever, is probably a different species of spirochaeta.

THE SPIROCHAETA PALLIDA.

The number of observers who believe that this organism is the cause of syphilis is increasing. The crucial tests of cultivation and inoculation remain to be made, but the literature is already exceedingly rich. T. Shennan begins in the March 10 issue of the *Lancet* a continued article giving a brief extract of the numerous papers already published. The conception of a contagium vivum for syphilis has long been accepted. Deidier as early as 1723 believed that it was due to a living organism. According to Lassar no less than twenty-five causes for the disease have been described during the last three decades. For a time Lustgarten's syphilis bacillus was recognized as the probable cause. Of late increased attention has been directed to a possible protozoal cause. One of the more recent of these observations is that of Siegel, who described a flagellated protozoön which he claimed to occur constantly in syphilitic lesions. Siegel's protozoön is chiefly of interest from the fact that it led to Schaudinn's investigation of the subject. He associated with Hoffmann, a skilled syphilologist. In a short time they reported the discovery of the spirochaeta pallida, or, as Shennan prefers to call it, spironema pallidum. It is curious that in the papers of Schaudinn and Hoffmann the organism described by Siegel is not referred to.

In the same number of the *Lancet* Richards and Hunt add a very striking communication dealing with the morphology of the spirochaeta pallida and organisms which resemble it. In chancres they have found an organism composed of straight or slightly bent rods, undulating organisms, and long, delicate, wavy spirals. These examined in the hanging drop were found to be different stages of the same organism. The spirochaeta pallida they have been unable to see in the hanging drop. So far all attempts to cultivate the organism have failed. They conclude that the spirochaeta pallida is the specific organism of syphilis. The spirochaeta refringens is another form of the same organism. The spirochaeta pallida is found in the deeper parts and the internal organs. The spirochaeta refringens occurs only on the surface, where the disease is manifested by external lesions. It is possible that the spirochaeta pallida circulates freely in the blood, and that as it develops it becomes spirochaeta refringens. In cases in which they have found spirochaeta pallida in the primary lesions they have found refringens in large numbers. They regard the latter as in a sense diagnostic of spirochaeta pallida.

Shennan in concluding his article in the *Lancet* of March 17, 1906, says it is astonishing with what unanimity this discovery has been accepted in Europe. The most important facts which favor the view that the spirochaeta pallida and syphilis are related is its occurrence in non-ulcerated lesions such as papules and buboes far from the primary sore; its occurrence in the circulating and splenic blood in acquired syphilis and its absence from non-infective tertiary lesions; its definite localization in the corium; and that it is absent in non-syphilitic diseases. Against its being the specific organism is the fact that the numbers in which it is found bear no relation to the reactive changes in the tissues. As Siebert points out, this is without analogy in the domain of pathology. The claim is advanced by some that forms indistinguishable from the

spirochaeta pallida are found in non-specific lesions. It is pointed out that before the etiological relationship is accepted far more should be known of spirochaetæ in general. He refers to certain peculiar loop-like and rounded bodies found in syphilitic glands which should have more attention paid to them. While Schaudinn primarily set out to study the organism described by Siegel, he makes no reference to it in his published communications, having discovered the spirochaeta pallida, which he evidently regarded as a far more probable cause of syphilis. While this opinion of Schaudinn should receive the fullest consideration, as he is an accepted authority upon the protozoa, it is noteworthy that Siegel in the second issue of the *Münchener medicinische Wochenschrift* for the current year reaffirms his confidence in the cytorrhyctes luis as the cause of syphilis. He has found this organism in the blood of syphilitic patients, and has been able to propagate it in rabbits and mice. In one of the rabbits he found miliary nodules which resembled gummata. That his organism will thrive in such widely different species is rather against the view that it is the specific organism of syphilis, which disease seems to be restricted to the human and the higher anthropoids.

We have predicted in a previous editorial that early and more definite knowledge regarding the etiological relations of this organism would soon be forthcoming, and that improved methods of staining would be devised and possibly the organism would be cultivated. The former has already been achieved by Goldhorn, whose method is described by G. N. MacKee (*New York Medical Journal,* March 24, 1906). The stain is prepared by dissolving one gramme of lithium carbonate in 200 cubic centimeters of water. To this two grammes of Merck's medicinal or Grubler's B. X. or Koch's rectified methylene blue is added. This mixture is placed in a double boiler and heated until a rich polychrome is formed. Care must be taken not to allow the process to go too far, or a useless thin, watery fluid may result. The mixture is then filtered through cotton and allowed to cool. One-half of the fluid is neutralized with five-per-cent acetic acid and then added to the remaining alkaline half. A one-half-per-cent solution of eosin is then slowly added until the filtrate is of a pale-blue color with a slight fluorescence. The mixture after being allowed to stand for several hours is filtered through a double layer of heavy filter-paper and the filtrate allowed to dry at room temperature. The dry precipitate is pulverized and dissolved in commercial wood alcohol. After standing for two days the solution should be filtered for two days, and the stain is then ready for use. The stain of Dr. Goldhorn may be obtained already prepared on the market. MacKee says that with this stain the identification of the spirochaeta pallida is within reach of any one who has a microscope.

In searching for the spirochaetæ a mucous patch should be scraped with a sharp curette until serum appears. This should be transferred by a platinum wire to a clean glass slide, or the slide may be brought in direct contact with the lesion. The smear is allowed to dry spontaneously. The stain is then applied to the unfixed smear by a medicine dropper. After allowing it to cover the smear for four or five seconds it is poured off and the slide slowly introduced into a glass of clean water at room temperature. The slide should be introduced into the water in a slanting direction with the film side down to prevent any of the precipitate remaining on the preparation. It should be held in this position for three or four seconds, and then gently waved through the water three or four times. The specimen should be dried either by shaking it in the air or by allowing it to stand on end for a few

minutes. When the dye, which is blue, comes in contact with the water it turns purple, and it is necessary that the slide should be held stationary in the water for three or four seconds while this change takes place.

In MacKee's opinion Siegel's ingestigations must not be lost sight of, as the organism which he describes can usually be found in the blood of syphilitics. Possibly it has some relation to the disease.

Spirochaetæ in General.—Since the publication of Schaudinn's paper additional attention has been devoted to the study of these organisms. Moritz (*Deut. Archiv für klin. Med.,* Oct. 4, 1905) reports the discovery of spirochaetæ in a case of severe anemia and carcinomatous lymphangitis. The patient was a young man of 25 years, who died fifteen days after the development of an indefinite disease. He had fever, neuralgic pains, diarrhea, profound anemia, pleurisy, and pneumonia. The autopsy was made sixteen hours after death. Gastric ulcers were found, together with inflammation of intestinal follicles, islands of degeneration in the liver, and dilated lymphatics of the lung and on the pleura, containing cells which resembled those found in endothelioma or carcinomatous lymphangitis of the lung and pleura. In the bone-marrow of the femur and in the muscles of the mucous membrane of the intestine numerous spirochaetæ were found which had a length of from 3 to 6 microns, having three to six spiral turns. They did not respond readily to the usual stains and possessed no flagella. Their relation to the spirochaetæ of Schaudinn and Hoffmann seemed to be close.

Carini reports in the *Centralb. für Bakteriologie,* October 28, 1905, that he has found certain spirochaetæ in vaccinia pustules. He endeavors to connect these with the etiology of vaccinia. The same organisms were found in the spleen and certain other internal organs.

Yaws and syphilis have been regarded by Hutchinson as identical. Castellani says that the clinical symptoms, geographical distribution, and the pathological histology of yaws show that it is a distinct disease. He has found in this disease a spirochaeta which he calls S. pertenuis or pallidula. He claims that it is biologically different from the spirochaeta pallida of syphilis. F. C. Wellman (*Journal of Tropical Medicine,* Dec. 1, 1905) has discovered a spirochaeta in the papules of yaws which bore a considerable resemblance to S. Obermeieri. Castellani in two communications to the *British Medical Journal* of November 11 and November 18, 1905, says that he has demonstrated the presence of spirochaetæ in 11 of 14 cases of yaws. He used Leishman's blood-stain. The spirochaetæ colored well and resembled somewhat spirochaeta refringens. He was satisfied that only one species was present.

THE OVERCROWDING OF THE PROFESSION.

In past years this journal has referred to the fact that there was very little uplift in medical education. A few schools in the United States have increased their preliminary requirements and have broadened the curriculum so that they are capable of turning out accomplished physicians. The increase in requirements of these schools has furnished the opportunity for other schools to open the door for a quick and easy entrance into the profession. Within the last year or two there has been a marked falling off in the number of medical students. A few medical schools report an increase, but the average attendance is distinctly lessened. This happy result is probably brought about by a recognition of the overcrowding of the profession, which is rapidly leading to results in this country similar to those which obtain in Europe. Medical fees

have fallen to so low an ebb in Austria that physicians are performing vaccinations for five cents. We are on the verge in this country of a time when a recent graduate, no matter how well equipped, will have difficulty in earning a modest livelihood. Heretofore the conditions have been quite different, and it was not difficult for a young man to pick out a location. Large sections of the country were filling up and towns developed within a few days, all of which needed physicians. The number of physicians has been about 1 in 500, which is an overcrowding of the profession, but it is felt less in a country that has a large unsettled area and in which the population is increasing rapidly. These conditions have changed. The West is largely settled, and there is very little wild productive land open for settlement. An increased density of population will make the proportion of one physician to 500 inhabitants much more effective from the standpoint of competition than it is in a sparsely settled community.

There were graduated last year about 5500 medical students, more than twice as many as were needed to fill up the loss in the ranks caused by death. It is difficult to say just how many physicians died last year in the United States, but probably close to 2300. We therefore need that number of medical men to fill up the ranks depleted by death. The addition of over twice this number to the already overcrowded ranks will produce a condition of affairs where the supply of medical talent will be so abundant and the wages will be so low that a living will be practically impossible.

It should be the business of physicians everywhere to dissuade students entering on the study of medicine. They should be frankly told the situation and advised not to begin the study. If every medical college in the United States were to be closed for five years, it would be of advantage to the profession and the community.

SUDDEN DEATH IN PULMONARY EMBOLISM.

Nothing is more trying to the practitioner than a sudden and unexpected death in a person who has been under treatment. The laity expect a doctor to name the cause of all diseases and to predict their outcome with reasonable accuracy. The sudden death during convalescence from an acute malady after the physician has assured the family and friends that the worst was over creates an embarrassing situation for the medical attendant. Such a situation is commonly created by pulmonary embolism. It occasionally terminates the scene in severe illnesses, particularly those due to septicemia, and it occurs after acute maladies, fractures, and following operations, when everything seems to be going well, and no amount of skill can anticipate its occurrence.

Alfred Parkin in the *Clinical Journal* of March 21, 1906, discusses a case of this kind and offers some advice. A patient whom he had been attending had been affected with a double pleurisy, in which there was such improvement in the symptoms that the patient desired to leave her bed. One lung did not clear satisfactorily, though she seemed to be getting rapidly well. One morning she was taken with somewhat hurried breathing, and in thirty minutes she was dead. She was seen ten minutes before her death, and there were no physical signs in the chest which could be of use in diagnosis.

Parkin believes that the best course to pursue under such circumstances is to tell the friends that the death was quite as unexpected for the medical man as for them, and to state that it might be accounted for by a number of possibilities, such as angina pectoris, cardiac failure, pericardial effusion, or pulmonary embolism, and that the only possible way of clearing up the matter is to have a post-mortem examination.

On the post-mortem examination in this

case pleurisy of the left side was found, that being the side of the chest first affected. On the right side the pleurisy was somewhat more extensive, and there was about two ounces of fluid. There was no pericardial effusion. The coronary arteries were slightly atheromatous. The right auricle was full of an ante-mortem clot, which was adherent to the wall of the auricle and was decolorized. The pulmonary artery at its division was blocked by a detached piece of this clot, and the clot spread into practically all the branches of that artery.

In discussing the pathology of the affection Parkin says that it is almost certainly fatal unless only a small branch of the pulmonary artery is affected. Everything depends on the size of the embolus. If the emboli are very small, as in ulcerative endocarditis, only small wedge-shaped infarcts of the lungs result. Large emboli which cause death instantaneously or within the hour are due either to ante-mortem clotting in the right auricle or to the detachment of a part of a clot formed in a vein. The cause of this clotting is not known. Thrombosis in veins which may result in subsequent blockage of the pulmonary artery occurs after labor, in diabetes, typhoid, gout, and after operation either on the veins themselves or operations for pelvic tumors in which large veins have been ligated. There is no satisfactory explanation why thrombosis and detachment of clots should occur in only a small percentage of cases. It is most likely to happen in depressed states of health, and it probably has some underlying blood conditions; after parturition it is probable that embolism is due to certain slight septic changes. The theory of sepsis would be accounted for in the case under consideration, as a focus of bronchopneumonia about an inch in diameter was found in one lung. In the recorded cases death from embolism after excision of varicose veins, varicocele, and abdominal operations is probably due to septic changes.

Some sudden movement on the part of patients, such as getting up frequently, leads to the detachment of the clot. In the case described the patient had passed a good night, and previous to getting up in the morning had been chatting with her husband and was in excellent spirits. Soon after she arose she was suddenly seized with difficult breathing and died within an hour.

SUCCESS IN THE MEDICAL PROFESSION.

Work has been extolled as the master word in medicine. A considerable proportion of the members of our profession, like those in other walks of life, have achieved success by surmounting obstacles. The value of industry has been extolled by the sages of all ages and is reflected in the proverbs of every race. Of late a medical education has become expensive, the term of study has been lengthened, and the cost of medical education increased by the necessity of clinical work and extensive laboratory facilities. Young men have been advised not to enter upon the study of medicine unless they had independent means which would enable them to get a sound medical education and then wait half their lives before obtaining a practice. Elsewhere in this issue we have urged medical men to discourage students from entering on the study of medicine, that the American medical profession is already uncomfortably crowded, and that the opportunities for gaining a livelihood from the practice of medicine are rapidly diminishing. The chances for a man of moderate means who has the industry, determination, and ability are as good as for those who are better equipped financially. Industry, ability, and determination will be the determining factors in the future as they have been in the past.

The same ideas were reflected by Sir Frederick Treves in the rectorial address before the University of Aberdeen. He said that the fac-

tors commonly held to be of importance in making for success in medicine, such as money, influence, social position, and even genius, were of little account. Money relieved men from drudgery and enabled them to devote their attention to original research, but such drudgery was not unproductive. The often-extolled leisure of the man of means is not unlikely to be devoted to original research in fly-fishing and golf. The elements of luck he held to be practically negligible, as it was mostly an expression of the ability of a man to grasp an opportunity when it presented. Genius was easily disposed of, as it might lead to flippancy and instantaneous diagnoses, which were a hindrance to a progressive physician. The great masters in medicine, such as Harvey, Hunter, and Lister, cannot be held to have been geniuses. He expressed confidence in the synthetic genius who was the product of hard work rather than the congenital genius with his erratic instability. Hard work, patient observation, and persistent reasoning are factors within the reach of any mortal who is determined to make use of them.

THE CAUSE OF BERIBERI.

This disease has been pretty definitely shown to be due to an excess of rice in the diet, or possibly altered or changed rice. Takaki, the eminent director of the Japanese navy, in a recent address before the Harvard Medical College asserted that the disease was largely due to errors in diet. Personal contagion may be practically excluded. In the acute form of the disease death may take place in twenty-four hours or as late as five days. The principal symptoms are palpitation, cyanosis, coldness of the limbs, loss of appetite, together with difficulty in breathing. In the subacute forms there is stiffness in both legs, particularly the calf muscles. There is a loss of sensation on the inside of the legs with pain in the calf. There is numbness of the finger-tips, which ascends the arms. There is muscular atrophy, drop-wrist—indeed, the clinical type of the disorder is characteristically a ptomaine poisoning. The results attained in the Japanese navy in treating this disorder on the dietetic theory have amounted to a very large and conclusive experiment demonstrating the origin of the disease. Under the old dietetic regulations there was an excessive amount of rice in the diet. A large share of the morbidity in the navy was furnished by examples of this disease and certain intestinal disorders which were associated with it and which were probably dependent upon the same cause. An increase of from 5 to 12 ounces in the meat ration has practically eliminated the disease from the navy. There have been only three cases in the last five years.

THE TEST FOR FORMALIN IN MILK.

According to the Bulletin of the Health Department of Chicago the use of formalin as a preservative for milk is becoming very rare. Out of nearly 12,000 samples of milk and cream collected between November, 1905, and March, 1906, no trace of formalin adulteration was found in any sample. The last case of this adulteration that was detected was in October, 1905. Every sample of milk or cream is tested for butter fat, of which the ordinance requires that there shall be not less than 3 per cent in milk and not less than 15 per cent in cream. In testing for butter fat an equal volume of concentrated sulphuric acid is added. This forms a layer beneath the milk or cream, and if any formalin is present, even in a quantity so small as 1 in 500,000, a purple-violet colored ring appears above the sulphuric acid. This ring is of a decided color and so characteristic as not to be mistaken even by casual observation. The ring normally formed above the sulphuric acid in the absence of formalin is

of a brownish hue, and totally unlike that produced when formalin is present.

The simplicity of this test if it is accurate, and we presume it is as the chemists of the Health Department should be in a position to ascertain its accuracy, makes the testing of milk for this adulterant very simple. In discussing formalin preservation of milk we have previously expressed the view that a moderate quantity of formalin would be less objectionable than a decomposed milk. If artificial preservatives are permitted it does away with the incentive for securing a sound and wholesome milk supply. It has been abundantly demonstrated that clean milk can be secured, and if it is promptly cooled and cared for it will reach the consumer in a sound condition. The addition of preservatives is but a poor substitute for cleanliness in harvesting and caring for this important food product.

FOOD PRESERVATIVES.

The passage of a national pure food law will inevitably bring up the subject of food preservatives. There is an impression that the preservation of food is a modern business. As a matter of fact it is as old as civilized man. The sun-dried meats and fish of savages belong to the early efforts of mankind to preserve food. A more elaborate domestic economy developed preservation by salting, smoking, the addition of saltpeter. That these were decidedly ineffective is shown by the epidemics of scurvy which occurred during the winter months in rural communities, and the decimating effect of the same scourge among sailors on long voyages. Scurvy was a common disease down to the middle of the last century, but the development of a new method of preserving food by canning in a large measure overcame this disease.

A more advanced chemistry has added many preservatives to the list—borax, salicylic acid, formalin, etc. It may be questioned how far these are deleterious. Certainly the addition of some preservatives to certain kinds of food, especially those in the nature of condiments that are used in small quantities is not objectionable, even in milk; if one had to take the choice between the possible deleterious results of a small quantity of formalin or a considerable dose of tyrotoxicon due to the decomposition of milk, one would better choose the former. Unquestionably where it can be done, food, so far as possible, should reach the consumer without a preservative, and where the older methods of preservation can be employed which impart a distinct flavor or other desirable quality to food, such as smoking, preserving in vinegar or in salt, these are to be preferred. The question of preservation of food is to be met by correct labeling. If a food contains salicylic acid, boric acid, or formalin, there should be a statement accompanying it giving the proportion of these ingredients. That this may result in a prejudice in favor of manufacturers who do not employ such preservatives is quite likely. This would resolve the whole matter into a question of commerce, where it properly belongs, only let there be no deception or fraud on the purchaser. It is probable that in the long run manufacturers will make just as much out of pure foods as adulterated or preserved ones.

FATIGUE IN SCHOOLCHILDREN.

It is to be regretted that more exact studies have not been made on the length of school hours and their value. The average length of the school day is six hours. It may be that exceptionally well endowed children mentally and physically may profit by such long confinement within doors, but we believe that for the average child it is too much. They would

probably learn as much were the hours reduced to four or even three. In cases of precocious and nervous children, where it is necessary for them to go to school for a shorter number of hours, it is often found that they do quite as well or even better than when they are confined in school for the whole period.

Joseph Bellei, of Bologna (*Lancet,* Feb. 3, 1906), has recently made a careful study of the mental fatigue produced in schoolchildren when there is only a short rest between the forenoon and afternoon sessions and when this period is greater. His former studies were made with a noon recess of only forty-five minutes, and the later ones with a noon recess of two hours. From his tables it appears that there is a marked increase in fatigue noted forty-five minutes after school convenes for the afternoon session. His conclusions are that a two-hour rest in the middle of the day enables a child to do work as well for the first forty-five minutes as at any time during the day. After that there is a rapid onset of fatigue, which persists to the end of the session. He comes to the conclusion that the work done by children during the afternoon school session is, on account of the great mental fatigue that it involves, of no advantage to them and is full of danger to their health.

DEFICIENT HUMIDITY AND ITS EFFECT ON THE RESPIRATORY TRACT.

Not long since we called attention to the importance of humidity in maintaining a comfortable temperature within doors during the winter months. A moist air is a relatively warm air. In a way this is popularly recognized by the frequent objections made to steam- and furnace-heated houses. Steam heat is said to burn the air. The dryness of the atmosphere requires that the temperature should be relatively high in order to maintain a sense of comfort. A temperature of 62° to 65° and the air well saturated with moisture is quite as comfortable as a temperature of 75° where the air is dry. To maintain a comfortable indoor temperature a higher degree of moisture is needed, and less heat. T. A. Starkey (*Montreal Medical Journal,* March, 1906) asserts that this extreme dryness of the atmosphere in houses is especially deleterious to the respiratory tract. It causes a hyperemia of the mucous membrane lining the respiratory passages, chiefly of the nose and pharynx. The writer refers to his personal experience during his first winter in Canada. At that time he suffered from congestion of the nose and throat, and to a less extent of the bronchial passages. He jumped at the conclusion that it was probably due to vitiated atmosphere, but a careful examination of the air in the rooms showed only a small quantity of carbon dioxide. He then turned his attention to the question of humidity, and found that it was always below 60° even with the windows open, and when they were closed it was 50° or even as low as 41°. An oversaturated air is unpleasant, the most comfortable degree of humidity being from 70° to 75°.

It is a well known fact that the out-of-door atmosphere tends to prevent respiratory diseases, particularly tuberculosis, and it has been noted that a cold air is relatively more efficient in treating tuberculosis than a warm air, even though both were pure. There is some difference that is probably due to the relative amount of moisture. It is quite certain that when this matter is studied more fully it will be found that the amount of moisture in the atmosphere has largely to do with the development of respiratory diseases. It does not exclude direct contagion, but it is possible for it to excite the local catarrhal conditions which furnish a fruitful soil for the development of infection.

ORIGINAL ARTICLES.

NEW APPARATUS FOR THE ACCURATE DETERMINATION OF UREA IN URINE.

BY G. H. MEEKER, PH.D., LL.D.,
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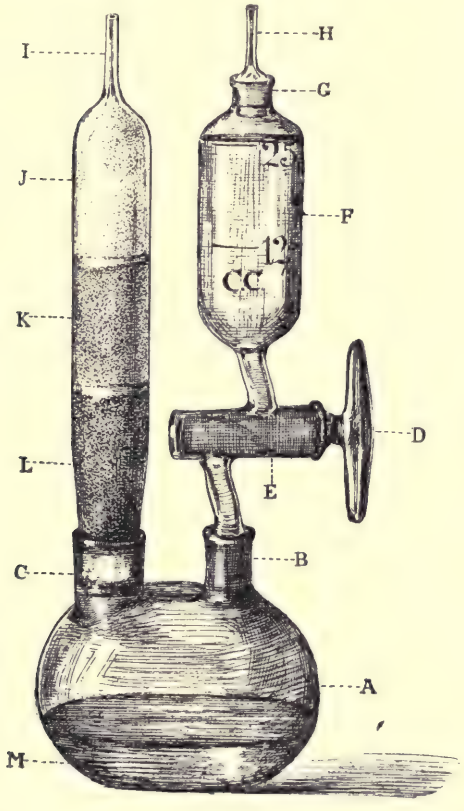
The Apparatus.—The new apparatus is shown in the accompanying illustration. It is made entirely of thin glass, about 8/10 mm. in thickness. A is a two-necked flask. The other parts of the apparatus are adapted to A by ground joints at B and C. D is a stop-



cock with oblique bore, E. The tube F is graduated so that either 12½ Cc. or 25 Cc. of urine may be measured from it into A. A stopper, carrying a capillary tube, H, is ground into F at G. The tube marked I, J, K, L has a capillary ending at I, and is ground into C at its lower end. L, K and J are, respectively, ferrous sulphate, soda-lime, and calcium chloride. These are all in a granular state, capable of passing a sieve having twenty meshes to the linear inch, and of being retained on a sieve having eighty meshes to the linear inch. Each powder is retained in place by a suitable plug of absorbent cotton. M represents 50 Cc. of a freshly made solution of sodium hypobromite. This solution is made by the following formula:

Sodium hydroxide	100 Gm.
Water	250 Cc.

Allow to cool and then add slowly:

Bromine	25 Cc.

The Analysis.—A known weight of urine is introduced into F, the cock, D, being closed. The exterior of the apparatus is wiped dry, and the whole apparatus is then weighed. The apparatus is now removed from the balance, and the urine run into the sodium hypobromite solution. Nitrogen and other gases are evolved. Of these gases, nitrogen alone escapes, through the tube, I—the other gases being retained in the apparatus by the sodium hypobromite solution, or by the granular solids in the exit tube. The apparatus is now set aside for thirty minutes, to permit the completion of the reactions and to cool. It is then weighed again. The difference between the two weights is the weight of nitrogen lost from the apparatus. Now calculate the percentage of urea in the urine.

Calculations are as follows:

Formula for urea, CON_2H_4.
Molecular weight of urea, 60.112.
Nitrogen in urea molecule, 28.08.
Let a = weight of urine used,
And b = weight of nitrogen lost from apparatus,
And P = percentage of urea in the urine,

$$\text{Then } P = \frac{\frac{60.112}{28.08} b}{a} \times 100 = 214.074 \frac{b}{a}$$

Or, when great accuracy is not required, and 25 Cc. urine is employed, the urine used may be assumed to weigh 25 grammes, and the equation becomes

$$P = 8.563\ b.$$

Or, in urines rich in urea, when 12.5 Cc. of urine is employed, the percentage is obtained by the following equation:

$$P = 17.126\ b.$$

Remarks.—The size of the apparatus here described is rather large for the usual chemical balance. If any difficulty is experienced from this cause, it is, of course, only necessary to reduce all dimensions as desired. The dimensions of my own apparatus are:

Outside diameter of A, 70 mm.

Height of A from bottom to space between necks C and B, 46 mm.

Total height of A to top of necks C and B, 66 mm.

Outside diameter of neck C, 19 mm.

Outside diameter of neck B, 13 mm.

Outside diameter of tapered neck of exit tube at C, 15 mm.

Outside diameter of exit tube K, 20 mm.

Outside diameter of capillary tubes at H and I, 3 mm.

Outside diameter of urine reservoir at F, 27 mm.

Total height of apparatus, 200 mm.

Total weight of apparatus when charged complete, about 175 grammes. The apparatus was made by Messrs. Queen & Co., of Philadelphia.

The question as to the best formula for the hypobromite solution I have investigated carefully. After experiments with many formulæ I have finally adhered to the one mentioned above as being the most satisfactory. This formula is the one recommended by von Jaksch.

The accuracy of this process for the estimation of urea has been tested by experiments upon two-per-cent aqueous solutions of pure urea. I find no difficulty in obtaining in this manner results practically coincident with those required by theory.

All other methods for the estimation of urea with hypobromite depend upon measuring the volume of the nitrogen evolved. These methods have failed to give the theoretic yield of nitrogen. I ascribe the accuracy of my process to these features:

(*a*) A comparatively large weight of urea is employed.

(*b*) The uncertainties which arise in the ordinary processes because of variations in pressure, in temperature, in moisture, in gaseous impurities, in mixing, and in the quantity of gases remaining in solution, are in this process minimized or eliminated.

Or, to summarize: A large weight of urea is employed; nothing is lost from the apparatus except nitrogen; and this nitrogen is measured with an accuracy possible only when the analytic balance is employed as the measuring instrument.

The purposes of the chemicals employed in the exit tube are as follows: The calcium chloride dries the escaping gas. The soda-lime frees the escaping gas from carbon dioxide and other acidic gases which may escape the alkaline liquid because of too rapid evolution of the gases. The ferrous sulphate was found necessary to free the escaping gases from some unknown compound or compounds of bromine.

The capillary tubes I and H were dictated

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by the following considerations: It was at first thought necessary to use a calcium chloride guard tube connected to I, and to have H connected, by another inlet, to the flask A. These connections proving cumbrous and troublesome, it was decided to try the effect of long capillary openings to the air, in the thought that they would prevent any circulation of air, though at the same time maintaining equality of pressure. Experiment proved these surmises correct.

In conclusion, it may be said that the method just described for the estimation of urea in urine has great accuracy, and is simple to perform. It requires, however, an analytic balance and a special glass apparatus.

SOME INTRICACIES IN THE PATHOLOGY AND DIAGNOSIS OF APPENDICITIS.

BY ERNEST LAPLACE, M.D., LL.D.,
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The vast amount of literature on etiology and diagnosis of appendicitis would seem sufficient to meet the requirements of the profession, were it not that experience constantly emphasizes the fact that the diagnosis of appendicitis, if based upon a definite set of clinical phenomena, remains obscure and uncertain. That deaths from appendicitis follow operations performed too late is sufficient evidence that the question is still unsettled.

In no abdominal disturbance are the symptoms so variable. Violent right inguinal pain, chill, and high temperature, with abdominal rigidity, constipation, and nausea, to a mere soreness, slight rigidity, and slight elevation of temperature, are two extremes widely apart; and yet appendicitis in a virulent form may exist under both conditions. Those who do not operate on a large number of cases may fail to realize the gravity of the situation in some cases.

Of late leucocytosis as an evidence of a serious inflammatory condition offered hope of a more precise diagnosis. This procedure has not advanced our knowledge. A fulminating case of appendicitis may develop so rapidly as to preclude the possibility of a leucocyte count because of the remoteness of the patient from laboratory facilities. The leucocyte count, while sometimes an indication of pus, frequently fails to reveal the sepsis that may be developing. Leucocytosis results from the absorption of the toxin of the developing infection, when it is highly irritating; so that on entering the general system there is proliferation of an excessive number of white blood-corpuscles in the peripheral circulation, hastening to the relief of the local irritation about the appendix.

If the staphylococcus or streptococcus were the only infectious elements in the causation of appendicitis, the reactionary leucocytosis would always be present; their toxins are highly irritant, and the leucocytosis would be a fair index of the gravity of the situation, indicating the proper time to interfere surgically. But the pure staphylococcic invasion of the appendix is rather the exception than the rule.

The bacillus coli and the saprogenic germs of the intestines seem to be the organisms which, in the majority of instances, start the inflammation within or about the appendix. While these two organisms are highly infectious, quickly produce gangrene, followed by secondary infection of the staphylococcus, toxins when absorbed into the circulation are non-irritant, though highly septic. As a result

an infection of low degree may take place about the appendix, non-inflammatory in character in this, that the symptoms of acute inflammation may be absent, but the infection is so rapid and virulent as to result in a local gangrene within a short time. Under these circumstances the general economy has not felt the effect of the local irritation, and therefore not responded as it would have done had it been highly irritated by the toxin absorbed from the parts. Leucocytosis is absent, while local gangrene is going on.

These statements seem rather radical; perhaps an illustration will make the matter somewhat clearer. Fever occurs always as the result of an irritant applied to the central nervous system. It may result from a direct traumatism, as the nervous or surgical aseptic fever, occurring directly after an operation, especially in the young or in very nervous persons. In such a case, within an hour after operation, the temperature rises and remains high until the system regains its equilibrium. In such case a mechanical irritation is the cause. Fever can be produced by the injection of a chemical which irritates the central nervous system. Ten drops of compound tincture of iodine injected under the skin may be followed by a chill, and the temperature will remain above normal until the chemical is eliminated. Within twenty-four hours the temperature will be again near normal; and if the dose be repeated a similar result will follow. The chemical which has been introduced is comparatively harmless in itself, but highly irritant to the nervous system, and produces a disturbance of equilibrium in the thermogenic centers, resulting in fever.

A poison may be injected which does not irritate the nervous system, and no fever would result, but it would be so poisonous that it would destroy life; such poisons are morphia, strychnia, and cyanide of potassium. What I wish to emphasize is, that an irritating fever-producing chemical or toxin is not necessarily poisonous in a life-destroying sense; whereas a chemical or toxin that is not irritating and causes no fever may be fatal.

This explains an apparently contradictory condition. The appendix may sometimes be found to be slightly affected, although there has been high fever; and in other cases gangrene may be found when the temperature may have been but slightly altered.

Leucocytosis in the first instance where irritation and fever is present will exist; whereas in the toxic conditions, which are not accompanied by irritation, leucocytosis will be absent. Leucocytosis is only present when an irritating toxin is absorbed, and in these cases it is alone of diagnostic value.

This irritating toxin may be the evidence of an acute inflammatory and suppurative process. In this instance a marked leucocytosis is a signal of danger. A suppurative process if slow, and therefore less acute, may have time to surround itself by fibrous tissue, and as the process develops, being retained within a capsule as it were, there is less absorption of toxins and therefore less leucocytosis. Leucocytosis may be slight or absent, although an extensive suppurative process may exist; a dangerous abscess may exist ready to burst at the spot of least resistance, to be soon followed by general peritonitis; and still owing to its lack of reaction and isolation, sufficient toxins are not absorbed in the general system to give the danger-signal through leucocytosis.

Shall we abandon the leucocyte count in diagnosing appendicitis? Many surgeons have been open in their avowal of its unreliability, and therefore think it should be abandoned. I believe that this is an extreme view of the situation. Leucocytosis alone cannot establish the presence or absence of an infection. It is well to know, and record in every case when

possible, the leucocyte count. This will aid in understanding the case and may contribute to the final conclusion when all the other phenomena of the case are considered.

The temperature attending appendicitis is a source of constant discussion. It varies with the nature of the toxin and the organism whose development preponderates in a given case. While an elevated temperature indicates an acute inflammation, some of the most virulent infections are accompanied by normal or a subnormal temperature. We know the subnormal temperature in profound sapremia, and its fatal consequences. Temperature is valuable in the diagnosis in the same light, ratio, and extent as leucocytosis.

The pulse by which the practitioner, by custom and by tradition, feels that he can read more clearly than in any other way the true condition of the patient, is just as deceptive as leucocytosis and temperature. A strong and bounding pulse, rapid in character, accompanied by fever, is an indication of the stimulating effect of an irritating toxin that is absorbed. A rapid and small pulse indicates the absorption of a toxin that is depressant; such as occurs from saprogenic infection. This is only marked when a severe infection exists. There are conditions—and these are most deceptive—where the pulse is normal, and hence the patient is supposed to be in little danger. In these cases the temperature, pain, and general condition of the patient must be the guide to what is going on in the abdomen.

In my judgment it is the direct result of the absorption of toxins of the two distinct infectious elements: one which stimulates, and one which depresses. A mixed infection having taken place, two toxins, one of a stimulating and another of a depressing character, are produced and result in a pathological tug of war upon the innervation of the heart; the result is an apparently normal pulse, but in reality a very pathological pulse.

Pain is really the most constant symptom in the diagnosis of appendicitis. All irritants produce pain, but some more markedly than others. Some irritants produce pain increasingly as the irritant develops. This takes place notably in the staphylococcic infection. This toxin produces fever, accelerates the pulse, and increases leucocytosis; in such an infection, pain existing from the first becomes notably more marked. Not so with the other infections. At the first start, pain becomes noticeable, perhaps increases; and then as though the pathological condition were decreasing or disappearing, the pain decreases and even ceases. This should not be considered as an indication that the course of the appendicitis is retrograding. Under such conditions it is possible that the pathological condition, though giving less pain, or even no pain, is still progressing toward a general gangrene. It is difficult to realize the truth of this assertion, but a striking example can be found. A young woman with a bone felon of the index-finger of the right hand dipped the finger in carbolic acid to relieve the pain. The anesthesia following the application relieved the pain. She continued this treatment, soaking the finger in the pure carbolic acid over night. Though free from pain, having no fever and no acceleration of the pulse, the finger was found to be gangrenous the next morning and required amputation. This was an example of a violent irritant acting fatally upon the life of the tissues without causing pain, temperature, or acceleration of pulse. It is easy to understand that a toxin could be produced within the appendix, from the virulent saprogenic germs, whose result upon the poorly nourished appendix would be similar to carbolic acid, producing a gangrenous appendix without general irritation.

I am convinced that similar conditions occur within the appendix. In this way alone can cases be explained, in which an operation was

necessary after the pain had ceased and the attending physician believed the attack was past. These cases, which seem to smolder for a while, may progress rapidly, infect the peritoneum, and be followed by a fatal termination.

Muscular rigidity over the appendix and its neighborhood, as compared with the rigidity of the left side, has been asserted by many as being the only unerring symptom of an inflammatory condition beneath. I will admit that it is a valuable symptom; but a deep-seated inflammatory condition may exist without it. In the majority of instances of appendicitis the ileocecal region with the appendix lies close to the peritoneum, and according to the rapidity of the inflammatory condition, the appendix adheres as best it can to some neighboring structure. As the process advances the parietal peritoneum will sooner or later become united by inflammatory processes, and show irritation. This irritation may be accompanied by much or very little pain, but if the parietal peritoneum is irritated, the irritation will find a reflex expression in the contraction of the muscles of the abdominal wall. This is the rigidity in question.

Should the pathological element be of an infectious character, but not highly irritating, and furthermore, should the infection take a downward course—that is, away from the parietal peritoneum—there may be no reflex contraction of the abdominal wall on that side, and muscular rigidity will be absent.

Sooner or later the infection will find its way toward the parietal peritoneum, and result in the contraction of the abdominal wall; but the irritation may reach the opposite side and produce a similar amount of contraction. In such cases rigidity is the same on both sides and it is overlooked.

Constipation has been reckoned a valuable symptom, but it is only relative. Constipation and abdominal tympany are simply the result of intestinal paresis or arrest of peristalsis. That this should happen so much pain or infection must already have occurred as to result in the reflex action of the sympathetic system, whereby the normal peristalsis is lessened or arrested. By this time matters are serious, and the infection has already made considerable headway. In the initial stage of the process the irritant that starts the inflammatory process in the appendix also exists to some extent about the ileocecal region. Cases are very frequent in which an acute enteritis exists, and following upon this a clear case of appendicitis. Obstinate constipation is serious, and indicates an already advanced development of the inflammatory process about the right inguinal region. The significance of constipation should be recognized.

The anatomical situation of the appendix is not constant. The McBurney point, midway between the anterior superior spinous process of the ilium and the umbilicus, is supposed to cover the normal location of the appendix, and therefore the spot where the maximum pain is to be elicited on deep pressure. Were this invariably true, the subject would be somewhat simplified. While the appendix is usually in the McBurney location, it has been found as high as the under surface of the liver, in the rectal cul-de-sac, and even in the scrotum. Its location on the left side is by no means a rarity.

Pain away from the right iliac region does not exclude appendicitis. The abnormal situation of the appendix is not so rare that it will excuse an erroneous or tardy diagnosis.

From what has been said should I be judged an iconoclast in the matter of diagnosis of appendicitis, destroying what has been commonly accepted as sufficiently reliable diagnostic symptoms, and offering nothing as a substitute for the physician's guidance? I am not prepared to answer this. I have only stated facts,

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based on unfortunate cases, in which these facts have been unrecognized or ignored, and which went on to a fatal termination. There has not been one word of theory, but bare facts, based on a study of 1000 operated cases in a period of sixteen years.

I believe it is possible to bring down the mortality in cases of appendicitis to one-half of one per cent. This allowance is for extraneous causes, such as the anesthetic, and heart, lung, and kidney complications, which may follow the operation. Appendicitis proper should have no mortality. To reach this desirable result the operative treatment is the only one that should be considered. It is the only one that offers a sure recovery in all cases, when undertaken in time, before the infection has gone beyond the possibility of complete removal by the knife. If we aim to save all patients, and not merely a certain proportion of them, the early operation will alone secure this result.

The medical treatment as at present understood and practiced exercises no direct influence upon the course of the disease, once genuine inflammation has started in the appendix. It is indicated and achieves results only in the preinflammatory stage, or the stage of appendiceal irritation. When suppuration or gangrene has set in, medical treatment is but a professional capitulation to the disease, leaving nature, not the human intellect, in charge of the situation.

The profession should recognize a stage of irritation, or preinflammatory stage of appendicitis, and relieve this condition as promptly as possible by medical measures; failing in this the appendix should be promptly removed before the inflammation leads to suppuration or gangrene.

Appendiceal irritation or preinflammatory stage appendicitis may be recognized by a sudden or slowly developing pain in the abdomen, persistent in character, generally in the right inguinal region, though it may occur elsewhere. The cause of this pain is either within the intestine or within the appendix. This is the stage of irritation. Fever, constipation, or rigidity of the abdominal wall may be present or not. A sharp purgative, such as magnesium sulphate, should remove the irritation and relieve the condition, if the offending cause is within the gut. An ice-bag applied over the seat of the pain should materially assist in subduing the irritation. If in spite of these measures the pain is not subdued, or if lessened for a time or having disappeared it again returns, then we must conclude that this persistent and violent irritant is not in the intestine, but in the appendix, which is so closed or swollen somewhere in its course or at its union with the cecum as to prevent the drainage of the irritating substance into the cecum. The infectious material is beyond the reach of the cleansing measures. Should the process stop short of suppuration or gangrene, I cannot see how any medical measure can have arrested the process, for I fail to see how any medical measure could reach it. It is the *vis medicatrix naturæ* that succeeds in these cases. Experience teaches that it works successfully only in 60 to 70 per cent of cases of first attacks. No statistics are available for second attacks. The more frequent the attacks, the more virulent they become, from the diminished resistance of the parts, which are deformed by adhesions and are lessened in vitality.

There exists no way of ascertaining *a priori* that a given case will be successfully cared for by nature. Recently just such a case came under observation. A boy of 17, in his first attack, after four days of medical treatment, when purgation on the first day had failed to relieve his symptoms, was brought to me for operation, but too late. Fulminating peritonitis had already set in, and death ensued before an operation could be performed. There was no pain. The temperature was normal, but the pulse weak.

Any first attack may turn out like the above, in spite of the fact many have been tided over the initial seizure. The proportion is 60 to 70 per cent. Will your next patient with his first attack be among the unlucky 40 or 30 per cent who are apt to die from their first attack if not operated upon in time?

Let us unite in a common effort to reduce the mortality of appendicitis to a minimum. We know that the removal of the appendix is a harmless surgical procedure, provided suppuration or gangrene does not already exist. I have explained our utter inability to accurately and infallibly ascertain the nature and degree of an infectious process about the appendix in the depths of the abdominal cavity by clinical or laboratory measures. I have shown how, on the general principle that prevention is better than cure, it is better to remove an appendix before it has time to suppurate and become gangrenous, than to wait for nature's uncertain help.

You know the harmlessness of the operation in the stage of irritation. Therefore let us teach the people this truth, and *promise a patient* a certain cure if the operation be performed during the preinflammatory stage. The results will sustain your promise. There being fewer fatalities from the operation, it will lose its dread, and patients will no longer hesitate. Preventive surgery will then have conquered a most insidious and treacherous foe.

THE PRINCIPLES OF TREATMENT OF HYPERTROPHY OF THE PROSTATE.

BY CHARLES GREENE CUMSTON, M.D., BOSTON, MASS.

During its evolution, hypertrophy of the prostate goes through quite a regular cycle, so that one may divide it into successive stages, during which the disturbances are, in the first place, of a dynamic nature, finally developing into a mechanical order. Dysuria predominates in the history of prostatic enlargement; in the first place it alone is present, and afterward becomes complicated with various forms of retention and incontinence at the end. Infectious phenomena not infrequently become added, and these may arise in any of the periods of development of the affection, resulting in symptomatic changes, a fact which necessitates considerable knowledge on account of its importance.

Speaking generally, we are dealing with patients averaging in age from 55 to 70 years, presenting disturbances of micturition, which may have appeared slowly and silently, while in other instances they may have developed suddenly after exposure to cold or to some excess; and here we have the stage of *dysuria without retention.*

The patient will complain of pollakiuria, especially nocturnal, he being unable to resist the desire to urinate, micturition is difficult, the stream is slow in coming, while the patient is often obliged to strain and to assume the most peculiar positions in order to empty the bladder. The jet is narrow, rarely deformed, the force diminished, and the patient wets his boots at the end of the act.

These disturbances in micturition vary in intensity from one day to another, changing under the influence of rest or exercise, and becoming aggravated under the influence of resistance to the desire on the part of the patient, as well as the various causes giving rise to hyperemia, among which genital excitement should hold the foremost place. During this first stage, the patient frequently complains of erections which are not of a genesic nature, and are merely due to a full bladder.

At the commencement of the process the prostatic hardly ever suffers; the bladder is emptied slowly, but completely, and at the most there is occasionally a disagreeable sensation of tension in the perineum. This relative calm is most deceiving, and is frequently a cause of delay in seeking medical advice. During this time the conditions for retention are being prepared, the latter slowly developing, but usually, under the influence of congestive factors which have been mentioned, acute retention suddenly develops and the patient finds it impossible to micturate.

When this has occurred, confirmed prostatism has developed; the retention having been prepared by the slow development of the prostatic obstacle makes itself evident, either by acute or chronic retention. The former is the first manifestation of prostatic retention in a large number of cases, in which, up to that time, the patient emptied his bladder and only presented the various disturbances in micturition which have already been alluded to. This unexpected change in his condition is a cause of alarm; the desire to micturate, which up to this time has been frequent and imperious, but followed by accomplishment of the act, can no longer be satisfied in spite of every effort on the patient's part, occasioning distress, sharp hypergastric pain with extension toward the perineum, lumbar region, and tip of the penis; there is a rise in temperature accompanied with agitation, while the bladder can be palpated in the hypogastrium. Catheterization performed carefully, while emptying the urinary reservoir, will also give indications relative to the elongation and change in the direction of the prostatic urethra, while rectal exploration will show an enlarged prostate, tense and firm in consistency.

An attack of acute retention may be the only one that will arise, and after emptying the bladder the patient becomes quieted, but in other cases it may partially persist, and then chronic retention accrues, but this manner of commencement of chronic retention is not frequent, and ordinarily a prostatic first develops an incomplete chronic retention, which finally becomes complete from a slow but progressive exaggeration of the symptoms arising during the first period.

The frequency in micturition, which in the first place is nocturnal, becomes marked during the day, giving the patient no quiet; he is continually urinating; but the important point to remember is that the bladder does not empty itself, being unable to expel its entire contents. If the patient is requested to urinate, and if the catheter is afterward immediately inserted, it will be found that quite an amount of urine can be withdrawn, proving the presence of residuum, which varies in amount according to the length of time the process has been present. By rectal examination the size, shape, and consistency of the gland will be found to vary from one case to another, and when combined with hypogastric palpation the fundus of the bladder can be mapped out and an estimate made of the respective parts played by the bladder and the prostate in the affection.

As time goes on the quantity of urine voided at each micturition diminishes, and if now acute retention becomes added to the chronic retention, a condition of affairs frequently observed, these attacks act badly on the chronic retention, rapidly leading the patient to complete retention. The residuum has slowly increased in amount, to such an extent that the bladder is constantly distended by urine, its walls become atonic and its muscular structure weakened. Now this distention is not limited to the bladder, because the ureters, renal pelvis, calyces, and renal parenchyma undergo the effects of vesical pressure and become dilated in their turn.

These advanced lesions make themselves

known by a limpid polyuria (if no infection has become added), so that the patient may void anywhere from two to three liters of urine in twenty-four hours. Digestive disturbances make themselves evident at about this time, and the larger number of prostatics consult their physician for dyspepsia or because they are passing what they believe to be a too large amount of urine; but if one will bear in mind what the origin of dyspepsia is in most cases of middle-aged and elderly men, careful questioning and the discovery of residual urine in the bladder will rapidly confirm the diagnosis.

If a careful watch is not kept over the patient in chronic retention, he will then go on to the third period, which may be termed the *stage of incontinence,* but it is not common for a prostatic to reach this period without infection of the urinary tract. In this case, however, one will find that the patient is markedly poisoned, presenting a rise in temperature in distinct or latent attacks, which is quietly undermining the health, and without any apparent reaction will keep the temperature almost constantly at from 38° to 39° C. The digestive disturbances become accentuated, with a dry tongue, dysphagia, and diarrhea, alternating with constipation. The distended bladder, unable to contract, gives issue to the urine by overflow, this occurring in the first place only during the day, but it finally becomes permanent; this is true incontinence with cloudy polyuria, which at this period, on account of ascending infection, has taken the place of the limpid polyuria of the commencement. Under the combined influence of the digestive disturbances, causing difficulty in the nutrition, and the intoxication of the organism, cachexia becomes installed, and when this period is reached the prostatic has arrived at complete organic decay.

The normal evolution of prostatic hypertrophy is nearly always disturbed by complications which accelerate its progress, and belong, properly speaking, to the clinical picture that I have given. The majority of them consist in infectious accidents which are directly attributable to two factors, namely, congestion, which is always imminent in the prostatic, and the presence of bacteria which enter by various ways and whose virulence is kept up and increased by the congestion. All the organs composing the urinary apparatus may become infected. Prostatitis is very frequent, giving rise to localized abscesses, or, in some rare cases, the entire gland may be transformed into one vast pus pocket. Clinically, this process either increases the patient's sufferings or gives rise to pain and increases the difficulties in micturition. On the other hand, in some cases, it is quite astonishing to note a complete absence of symptoms. Rectal examination will allow one to make a diagnosis of prostatic abscess, as well as its size.

Cystitis, by far the most common complication, is observed at any time during the process, and it is usually chronic, with subacute attacks. It is very rebellious to treatment, and gives rise to purulent deposits which are sometimes greenish in color and gelatinous in consistency, and are quite characteristic of what has been commonly called catarrh of the bladder. When the period of chronic retention is reached this process in the bladder will increase the sensibility of the organ to tension and the force of the vesical contraction, so that the patients may occasionally be better able to empty their bladders during an attack of cystitis; but this is of short duration and simply represents an exaggerated irritability of the viscus without any useful effect.

The accompanying nephritis may be acute or chronic, suppurating or not, and is only a real complication when it undergoes its evolution with suppuration, and is then inseparable from pyelitis; the attacks of fever increase and

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the digestive disturbances become more marked.

Infection of the bladder with an accentuation of the fundus, the result of hypertrophy of the prostate, is a very favorable condition for the formation of calculi, and stone should be looked for, especially when the cystitis is stubborn to ordinary treatment. During complete or incomplete retention, hematuria is frequently met with, usually due to false passages or to sudden decompression of the walls of the bladder from a too rapid and complete evacuation of the organ, or it may be met with secondarily, having as a starting-point certain lesions of chronic cystitis, but in this case it is without any real gravity. Hematuria is also the result of another important complication, namely, carcinomatous transformation of the hypertrophied prostate. In this case the disease, which has developed like any ordinary hypertrophy of the prostate, suddenly acquires a new character, because in a few months the functional symptoms become more marked, hematuria likewise, and by rectal examination the prostate, which up that time was firm, smooth, and regular, is found hard, bossed, and sending off neoplastic prolongations along the seminal vesicles. Such a transformation is difficult to suspect unless the gland is carefully examined.

Such are the principal complications of hypertrophy of the prostate. Their apparition during the normal progress of the affection influences the treatment, darkens the prognosis sometimes, for the simple reason that they prevent the patient from being benefited by certain therapeutic measures which under the ordinary conditions will result in a cure.

Having made these general remarks, I will first take up those cases in which catheterization is the proper treatment to carry out, and I may say at once that this method has been upheld to be the only one suitable for these cases by many eminent men, but the large majority of surgeons do not uphold this systematic exclusion of operations in prostatic hypertrophy. However, it nevertheless remains a fact that in spite of the resources of surgery, at the present time quite legitimate on account of the recent progress made in the technique, one should not foregt that the catheter still exists and that it is necessary to know how it should be used. There are few surgeons who will not admit the good effect of intermittent or permanent catheterization in certain cases of hypertrophy of the prostate, and I believe that most will admit that by this means, the indications of which were long ago formulated by Guyon, will still remain the treatment of choice in many cases—that is to say, the one which will be of most benefit to the patient. Catheterization is above all the means to be employed in the treatment of retention in cases of enlarged prostate, but under certain conditions as soon as retention makes its appearance the patient enters into the surgical phase of his disease, because medical treatment and hygiene no longer are sufficient, and it is a general precept that the bladder should be emptied by the catheter as soon as it becomes incapable of spontaneously ridding itself of its contents.

It should not be forgotten that hypertrophy of the prostate develops slowly, and that very frequently, for a number of years, these patients will only have dysuria before retention supervenes. In a large majority of cases there are temporary attacks of retention, and if one is consulted at the right time these attacks should not be awaited before resorting to the catheter, much less their frequent repetition. Take, for example, a patient who complains of frequent micturition, especially during the night, and whose daily quietude is no longer quite perfect; such a patient voids little urine at a time and never completely empties the bladder. Slowly

and silently retention develops, and this is the history of a very large proportion of prostatics. When consulted, the catheter is passed after the patient has voided his urine and a moderate vesical residuum will be found. If it is found that with a single catheterization a day, rarely two, the situation is improved, this condition of affairs should be made the most of, and an attempt should be made to do away with the stagnation of urine which keeps up the congestion of the bladder and prostate. If one is dealing with a case requiring catheterization only from time to time, when the bladder does not empty itself as well as usual—upon the occasion of excess at the table, etc., for example—palliative treatment is indicated *a fortiori*.

I will not insist on acute attacks of retention which are merely epiphenomena, where medical treatment, combined or not with catheterization, produces excellent results. Other than the occurrence of these crises, the clinical aspect of the patient returns to the same condition that I have already described, on the condition that the attacks are not too frequently repeated.

Now these patients should not be allowed to get beyond simple stagnation, which is the cause of both congestion and pollakiuria, two conditions which keep up a vicious circle. By catheterization regularly performed, with rigorous asepsis, preferably twice a day, vesical inertia is averted; the organ is still capable of contraction, and the use of the catheter helps the muscular structures of the bladder, giving it rest and allowing it to recuperate its functions, and after a few days or weeks micturition improves and becomes spontaneous and complete. The bladder is thus rid of its stagnant contents, which would have increased from day to day, only to end in distention of the organ. Thus one prevents the frequency of the attacks of congestion, which act so badly on the prostate, which, from this condition, undergoes successive increases in size, while ammoniacal fermentation is prevented, a source of inflammatory accidents greatly favoring total contamination of the urinary tract. Many cases could be cited in which the bladder regained its functions and fulfilled them regularly for many years when proper catheterization had been resorted to, and in which retention never occurred. Tédenat has reported several cases in which, after one or several attacks of retention, methodical catheterization or the temporary catheter has caused all the accidents to disappear, bringing the condition of affairs back to their primary state without aggravation of the dysuria, and has allowed the patient spontaneous and regular micturition of not too frequent occurrence during a lapse of from eight to ten years. Early catheterization should also be advised in patients whose urethra allows the passage of the instrument without difficulty or pain. The good health and quiet resulting from catheter life may be disturbed from time to time by an attack of hyperemia resulting from some excess or an irregularity in the use of the catheter, but when the latter is carefully carried out the number of daily micturitions is frequently diminished, and there are even instances where a nearly normal and voluntary evacuation of the bladder may persist for a number of years.

There is one important point, however, relating to catheter life which should not be forgotten; I refer to the social condition of the patient. People in well-to-do circumstances can more easily undergo this treatment, provided that an intelligent aid can be found in the family, who will see that the catheter is methodically and aseptically passed, because infection is the enemy to be avoided.

It must, however, be admitted that even with the most minute care infection, or rather a cloudy urine, arises after a certain time of catheter life, and it is surprising to see a pa-

tient who before catheterization had perfectly clear urine finally voiding cloudy urine which at length becomes purulent, nô matter what precautions one takes. This is more particularly met with in cases who present themselves with retention and distention, a condition which I shall discuss later on; but I am desirous of pointing out this fact, which is rather difficult to explain, and has led certain authorities to believe that the catheter is the source of this disaster and that the instrument should not be employed regularly, believing it better to allow the patient to continue with distention and incomplete retention, with which he has lived for some time.

I now come to those cases in which catheterization becomes the treatment of necessity, and in which prostatectomy should be discarded. It must be admitted that catheterization is not brilliant as far as its results are concerned in these cases, but if surgical interference is to be resorted to, the method of choice is suprapubic cystostomy. It must also be conceded that frequently no treatment succeeds in a case of prostatic hypertrophy, that some other procedure besides catheterization is necessary, and still there is no interference to propose. Catheterization or operation is legitimate in patients presenting certain accidents, but which are not sufficiently serious or of long enough duration and have not completely dominated the clinical picture, in which there is retention and relatively little infection. However, when the latter increases, involving the upper urinary tract, markedly influencing the general condition, this far-advanced evolution of the complications does away with all hope of any durable improvement, and there is considerable perplexity relative to the choice of treatment which will give the best results. Retention, infection, and pain are the principal symptoms around which the treatment of hypertrophy of the prostate circles. Take, for example, the prostatic who has come to the third stage; the bladder, which has not been aided, has passed from simple urinary stagnation to distention, the patient micturating by overflow. Chronic urinary cachexia has silently developed and renal insufficiency is near at hand, because the upper urinary tract is, from the fact of distention, destined to sclerosis of the histologic elements of the kidney, while the whole of the system is in a state of hyperemia.

In these cases catheterization is a double-edged knife. It is quite true that it may progressively bring back the condition of affairs to simple retention, but more frequently it increases the infection, up to then latent. Such a patient, from the congestion present, is menaced by complete and very acute infection; the prostate, bladder, and kidneys become inflamed at the same time. According to certain authorities, the majority of patients should be allowed to empty the overdistended bladder themselves. If the rational treatment by slowly progressive aseptic evacuation places the patient in considerable danger, his condition does not seem *a fortiori* proper for prostatectomy.

In point of fact, such a patient is afflicted with chronic urinary poisoning—that is to say, his digestive functions are greatly disturbed, the tongue pasty and dry, he loses flesh, and frequently presents slight febrile attacks, or sometimes even marked typical crises of acute urinary fever, from which he may or may not succumb. The elevation in temperature adds its effects to those of renal insufficiency, while the febrile and uremic phenomena bring about a cachexia making the patient a *noli-me-tangere*. He must be treated with excessive prudence, because he is no longer a prostatic, but a renal case with urinary intoxication. Consequently, it is probably wiser to abstain from all interference on account of the poor general condition.

So much for the more or less latent renal condition. Then in cases of confirmed pathologic changes of the upper tract—for example, pyelonephritis with cloudy polyuria, disturbances in the digestive functions, and an oscillating rise in temperature without remission—it goes without saying that no interference should be proposed. Such patients have little resistance and cannot undergo an operative traumatism, and for that matter the time for operation has gone by; the urinary system is too greatly involved to repair itself, even if the obstacle to the flow of urine is removed, and I believe that all authorities have pointed out the great mortality of prostatics who have been operated on late in the development of the affection. Mansell Moullin had twenty per cent mortality in 94 cases of prostatectomy, the former being due to patients presenting serious renal lesions. In the more recent statistics published by Escat, representing the combined results of forty surgeons, it will be seen that there was a mortality of eleven per cent in 220 cases of perineal prostatectomy, uremia and infection being the principal causes of death. Besides, in certain diseases, such as diabetes, cardiac or pulmonary complications (conditions which naturally are always ascertained before proposing surgical interference), any essay of a radical cure offers considerable risk and a minimum chance of success, and it may be said it is absolutely contraindicated in certain septic complications of the urogenital system. Thus, when a prostatic or periprostatic abscess develops in a hypertrophied gland, prostatectomy in these infected tissues is dangerous and would seem to be never crowned by success. Catheterization performed four or five times in twenty-four hours, with irrigation and minute care, is not attended with any results of a favorable nature, the urine remaining filthy and the temperature raised in spite of quinine, urotropin, and strict diet.

After prostatectomy the patients still have an elevation of temperature and serious general phenomena in spite of the disappearance of pain, and death frequently occurs within a few days after the operation.

A condition which should be carefully considered is sclerosis of the bladder, its presence being indicated by pockets and well developed bars. Under these circumstances prostactectomy does not improve the evacuation of the bladder and the patients are obliged to continue catheter life. This result may be foreseen before operation is undertaken, when after having repeatedly catheterized the patient no improvement takes place. In these cases operation is irrational and catheterization is absolutely necessary. Consequently, in cases in which nephritis is present with symptoms of marked urinary infection, an advanced sclerosis of the bladder with undermined health, an operation such as prostatectomy is decidedly contraindicated, because it will usually aggravate the situation. Catheterization is alone proper, although imperfect in its results.

Surgical interference is only legitimate in cases in which imperative operation is required, the patient still continuing to suffer in spite of all treatment, or if catheterization is difficult. Here suprapubic cystostomy appears to be the least objectionable operation and can alone save life in certain cases. By this operation old purulent bladders are opened and drained just as in cases of abscess. Suprapubic drainage will give all the desired results that can be obtained by a rapid palliative interference, namely, a reëstablishment of the urinary flow and the complete evacuation of the bladder, preventing retention, thus allowing the patient to escape from the most serious complication, urinary poisoning.

When a serious urinary infection has become established in cases in which catheterization has kept up infectious phenomena or caused them

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to appear, cystostomy will conjure the peril. In spite of the ease with which the catheter may be introduced into the bladder, it is only by this palliative operation that urinary cachexia will be avoided, and here we have the first class of cases in which cystostomy is of value. There are others—for example, chronic retention with distention—in which no sign of infection is present, there is no elevation of temperature, but urinary poisoning nevertheless exists, indicated by digestive disturbances, etc., and here again cystostomy may perhaps be indicated in those instances in which catheterization is difficult or badly tolerated by the patient. In these patients who are uremic, and frequently have emptied their bladders by overflow for a considerable length of time, the operation will allow the bladder to recover from its congestion, and also the unfortunate occurrence of witnessing the development of uremia a few hours after an aseptic catheterization has been undertaken. It is in these cases that an early suprapubic cystostomy has saved numerous patients by conjuring the evolution of the accidents, or delaying them, at any rate.

This operation is the least dangerous in infected patients, and Poncet has given statistics of 42 infected prostatics, the infection varying in degree. Some of these died two or three days after the interference in cases of very acute septicemia, but, as this eminent authority points out, the patients succumb in spite of the operation and not from it. On the other hand, out of 12 patients presenting acute septicemia, 4 died during the first week, the others living from 6½ months to 2½ years after the operation. And lastly, out of a total of 24 cases of chronic septicemia, 7 died during the first eight days following the operation, 10 lived less than a year, while 7 others enjoyed good health a year and a half, two years, and three years after the operation. Certainly these results should be considered satisfactory. Old age in patients who are infected, and with retention, especially if the catheter is easily passed, should also be a reason for rejecting operative interference, while if catheterization is powerless against pain and infection, cystostomy will frequently relieve the congestion of the prostate and control the accidents which have required an imperative palliative interference. This operation makes catheterization possible afterward, and later, when the bladder has been disinfected and the congestion of the prostate relieved, a radical interference may perhaps be undertaken, because there are cases favorable for prostatectomy in very elderly men, but whose bladders are not infected. Other than advanced infection and old age, there are cases in which catheterization is to be preferred to any operative interference, even cystostomy, on the condition, however, that the catheter can be easily passed. In old cachectic prostatics with infection, in whom even a slight traumatism is dangerous, this applies particularly. Catheterization is far better than operation, because the responsibility of the surgeon would be considerably involved. But cases are not wanting to prove that the use of the catheter alone has controlled symptoms quite serious enough to justify operative interference in marked prostatic hypertrophy.

Guyon compares the results in infected patients obtained by the use of the catheter and by cystostomy. Out of 49 patients running temperatures from 38° to 40° C., with a bad general condition and attacks of acute infection grafted on a chronic infection, he obtained 38 recoveries by the use of the catheter. These patients returned to the state of retention and remained well, on the condition that they emptied their bladders with a catheter daily, this being followed by irrigation. A second series of cases gave him 42 recoveries out of 50 cases, and from this study he came

to the conclusion that the mortality of cystostomy varied from 35 to 36 per cent in cases of serious urinary infection with fever, while with the use of the catheter the mortality was 20 per cent. According to this authority, the results obtained by the catheter are better, but I would point out that catheterization must be easily accomplished. If this is the case it may be preferred to cystostomy by certain operators, but if there is any difficulty in the passage of the instrument, the suprapubic opening should be resorted to. Catheterization and operation have frequently their respective indications well marked out, either as a treatment of choice, or as one from necessity, but there are also many cases, perhaps more numerous than may at first be realized, in which the indications of catheterization, or surgical interference, are about equivalent, and in which it is very difficult to come to any decision. Take, for example, the first stage of prostatic hypertrophy. At this stage, where there is only dysuria and no symptoms of true retention, other than temporary attacks of acute retention, catheterization is easy; a well directed diet and hygiene, with the passage of the catheter from time to time, appears to be the proper method to select. Numerous authorities, although not denying the excellent results obtained by the above treatment, point out the critical position of the patient, who at any time may develop retention or infection, the possibility of the dysuria sooner or later becoming aggravated, and consequently question whether or not a radical operation should be resorted to at once, thus doing away with all trouble in the future. A radical operation is performed under excellent conditions at this time and is far more likely to be successful, and at the present time it may be said that the operative mortality of prostatectomy at this period is almost *nil*. On the other hand, although prostatectomy at this time is practically without danger, it is a question whether or not it is exempt from inconveniences. The question of operation is certainly a delicate matter, because if it is true that the progress of the accidents is continuous, the evolution is occasionally so slow that many patients remain for many years in the first stage, urinating frequently, it is true, but with a properly regulated life they avoid all the complications of retention. Then, when acute retention supervenes, aseptic catheterization will bring things back to their primary condition, without any increase of the dysuria, and it is for this very reason that it is a difficult undertaking to propose an operation to a man whose affection disturbs him little.

In these cases it is probable that there is little fear of serious complications arising, whether catheterization or operation is resorted to. Both treatments may give satisfactory results, but nevertheless I cannot help feeling that these patients are just as well off by the careful use of the catheter as if they were operated on, and I believe that it cannot be denied that catheterization obviates the occurrence of congestion of the prostate and may produce a marked decrease in its size. Then, again, the genital functions are left intact in patients who at this period are usually still young and whose symptoms are not of sufficient importance for them to sacrifice sexual life. There are, of course, nervous patients who are haunted by their dysuria and demand at all price an operation, in which case prostatectomy should be resorted to.

In recent and incomplete retention with a former history of dysuria, hesitancy is also permitted in the choice of treatment. A radical operation may be undertaken, especially if the patient has had frequent, although temporary, attacks of retention. However, it should not be forgotten that complications in this period are frequently transitory, that there is no urgency, and that catheterization alone may

do away with the congestive phenomena in a few days, which are the factors of the retention. But here again the desire of the patient must be respected, and still more any difficulty in the passage of the catheter should, under these circumstances, be taken into serious consideration.

In the foregoing remarks I have endeavored to point out that the intelligent use of the catheter not infrequently represents the only proper treatment to resort to in prostatic patients with retention. But besides these cases there are those in which other treatment than catheterization must be considered, and then operative interference becomes the only resource, the performance of which should not be too long delayed. Radical interference, however, should never be undertaken until medical treatment and hygienic care, aided by the use of the catheter, have proved a failure and no longer control the accidents accruing from retention or urinary infection. For the moment, then, I would like to consider those cases in which simpler means become powerless, and by so doing we will arrive at the indications for surgical interference.

Foremost of all comes difficult catheterization as an indication for operation; but be it understood that I am not referring to surgical interference in retention, where catheterization is momentarily difficult on account of some fortuitous cause, because under these circumstances any immediate accidents may be averted by puncture of the bladder, a most precious makeshift for the physician when out of reach of help, but which be it understood should not be renewed unless absolutely necessary, and should be absolutely discarded as a therapeutic measure. Then, again, we have the temporary catheter, which may be employed during the day, but especially in the night, and this for a few days until catheterization again becomes easy, and under these circumstances a radical interference is not absolutely indicated, at least for the time being.

But besides these cases, there are other conditions of frequent occurrence where the use of the catheter is quite insufficient, uncertain, dangerous, or even impossible. I would first refer to the congestive phenomena, which may persist and become more marked, the first result being to keep up the retention. Repeated catheterization or temporary catheterization has become difficult in these cases, so that daily evacuation of the urinary reservoir cannot be assured, and at a still more advanced degree we have those cases of prostatic retention in which the catheter is very badly tolerated. The use of the instrument is so difficult that a false passage is easily made, and, added to this, more or less abundant and recurring hemorrhages appear, sometimes obstructing the bladder and urethra by clots, along with an elevation of the temperature, loss of appetite, and reaction on the general condition.

It is quite true that such difficulties in catheterization are not frequent, but they may arise even when the patient is under the care of an expert surgeon. Under these circumstances a radical interference is necessary, and one should do away with the cause of this perpetual vesical and urethral irritation, which will surely result in a local infection, in the first place, soon followed by general infection. Then again operation removes all the difficulties offered to catheterization, because after the removal of the gland the catheter passes easily and without danger. Operation should take the place of catheterization in order to avoid infectious complications with all their consequences which result from catheter life. Naturally, the social condition of the patient must be taken into consideration, because minute care in the passage of the catheter can only be obtained among the well-to-do. Difficulty in catheterization is the foremost indication for radical interference in cases of large prostate, as I have said, but on the other hand it frequently happens that the instrument is easily and well borne by the

patient; nevertheless an operation should be undertaken. I am referring here to those cases of chronic retention in which the bladder is to a certain extent emptied, although not completely, when several daily catheterizations are performed. The introduction of the instrument has been regularly accomplished, the technique has been aseptic, and the emptying of the bladder has been followed by careful irrigation; the instrument passes easily, giving rise to no pain, the hemorrhage is extremely slight, the patient going about with all appearances of well-being; but nevertheless, upon the slightest indiscretion in diet, or otherwise, sometimes even without cause, these patients suddenly run a temperature which does not give way to daily emptying of the bladder, and finally acute retention supervenes requiring the services of a physician. These attacks of acute retention are controlled momentarily by the use of the catheter and rest in bed, but they finally come nearer and nearer together, causing a most disagreeable existence for the patient, while the urine becomes cloudy. Now these are cases of slow urinary poisoning, and here the catheter and other treatment are no longer sufficient to keep the patient's general health up to the mark. A permanent catheter can certainly be tried, and has without doubt a fortunate influence over the temperature and the infectious manifestations, but it does not keep the temperature down completely, and after a while becomes manifestly insufficient to prevent the infection from continuing, so that operation becomes indicated.

Operation should be considered in those instances in which retention or painful phenomena with constant desire to evacuate the bladder predominate over the symptoms of retention. In these cases one is dealing with a purulent cystitis, which resists irrigation, methodical evacuation, and instillations of silver nitrate. The infection progresses and will attain the upper urinary tract, the patient then becoming a renal subject instead of a prostatic.

The frequency of these complications is very great, and they cannot always be prevented by the surgeon. Prostatics, above all, suffer from their bladder and not from their prostate, because it is the cystitis that gives rise to the various disturbances, rather than the prostate itself, and this is true not only symptomatically, but also from the view-point of the pathogenesis and stands out in the clinical history of prostatic hypertrophy.

In considering the proper radical operation to select, it would seem that perineal prostatectomy is above all the surest means of putting the bladder at rest, thus doing away with the hyperemia of the entire urinary tract, stopping the pain, lowering the temperature, and helping the kidneys. Cases are not wanting in which prostatectomy has been followed by most favorable and satisfactory results in chronic retention, or retention complicated by impossibility to catheterize, or very severe pain, complications for which it is most legitimate to operate. In the large majority of these cases the faculty of spontaneously emptying the bladder returns; micturition is easy; while the bladder may empty itself almost completely, in some less brilliant instances a slight residuum remains; the urine becomes clear, while the cystitis disappears.

There are, however, certain precautions which should be taken before the operation is done. When dealing with a complete or nearly complete retention, even if the urine is not bad, the catheter should be used for a certain time, being passed several times a day, or allowed to remain à demeure and the bladder carefully irrigated; by these means the organ is kept empty, its contractility is preserved to a certain extent, while ascending dilatation of the ureters and renal pelves is prevented.

Vesical contractility is of great importance as

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far as the results of the operation are concerned, but, unfortunately, one can never be sure of its exact condition, because in some cases in which the power has been thought to be absolutely lost, it returns completely after operation, while in others it remains abolished.

When catheterization is regularly done before a radical operation is undertaken, the contractile power of the bladder will be greatly aided, so that after the operation very excellent results will be obtained, as far as evacuation of the viscus in cases of complete retention is concerned. Bladder contraction, which in these cases has been absent for a long time, will return, and patients who have presented complete retention for a variable length of time will be able to completely empty their bladders and are no longer obliged to resort to the catheter.

There are other considerations which should be examined relative to radical interference. The age of the patient is of no great importance provided that it is not over 75 years. It is quite true that many surgeons, including myself, have successfully operated on patients over 80 years of age, but these are exceptions, and generally speaking, when operation is undertaken so late in life, one is usually dealing with an infected and intoxicated organism, which, even in successful cases, does not give rise to any benefit for a long period. The seriousness of the operation depends on another factor, far more important than that of age, namely, *infection,* and the excellent results which have been obtained in very old subjects have always taken place when the patient was not infected.

One should also remember that calculi are frequently met with in cases of enlarged prostate, the percentage being as high as 15 or 16. They are always secondary to infection, formed most usually by the cystitis, and are kept up and increased by it, while symptomatically they increase the pain, give rise to hematuria and attacks of acute cystitis, all this being added to the symptomatic pain ordinarily accompanying the increase in size of the prostate, thus rendering the diagnosis a difficult matter until the bladder has been opened and explored, so that very frequently their presence in the bladder goes by unrecognized until the organ has been opened.

In these cases operation is indicated to prevent infection arising from two factors, and it is evident that the catheter becomes quite insufficient. Suprapubic cystostomy and prostatectomy have both been proposed as methods of choice, and the question is still far from being definitely settled. It would, however, appear that perineal prostatectomy is the best operation under these circumstances. In point of fact, the prostate is the real cause of all these troubles and the development of the calculi, and they remain in the bladder because the enlarged gland prevents their expulsion, and also because the conditions which were the cause of their formation still persist, so that if lithotrity is performed a recurrence of the stone formation is inevitable, requiring periodical crushings. Now by prostatectomy the calculi are removed, the obstacle likewise, while the bladder is drained, thus realizing the cure of the cystitis and consequently the prevention of the formation of other calculi.

This result may be realized by cystostomy, but it is only of momentary duration, lasting only as long as the hypogastric opening remains, but these same complications will surely recur as soon as the opening in the bladder is closed. On the contrary, a radical cure of the retention and calculi may be obtained by prostatectomy.

The size of the prostate has also been considered relative to the indications for operation. A very large gland is not necessarily an operative indication, because there are many which do not produce any very serious functional disorders of the bladder, while in other cases in which the prostate is not very large, perhaps

being almost normal in size, it will produce accidents requiring operative interference. Generally speaking, the size of the gland should not be taken into consideration as far as the operative prognosis or end results are concerned, because the removal of small, hard prostates is quite as difficult and as serious as large ones. No importance should be attributed to the size unless a large prostate with cystitis and general infection is present. The size of the hypertrophied gland may indicate such or such a type of prostatectomy, but I shall not enter into this question.

So far I have considered the less favorable class of cases in which operative interference is one of necessity, and undertaken at a late date in the course of the affection on account of the difficulty in catheterization and the presence of infection.

The question arises whether or not there are instances in which a very early operation is to be advised in cases of prostatic retention and in which the very best results may be obtained —in other words, where operative interference becomes the treatment of choice. This indication is found in young prostatics—that is to say, in men from 55 to 60 years of age—who are in good health, easily catheterized with hardly any residuum, and in whom the urine is normal, or only momentarily cloudy. I believe that in these cases operation should be done in order to do away with future catheter life, which stares them in the face, especially when their social condition does not permit of regular and aseptic catheterization. When prostatectomy is done early under the above conditions, and in patients who are still strong, very remarkable results may be obtained, both from the operative and functional view-points, the organism being still in an excellent condition. When an early operation is undertaken, the contractile functions of the bladder are still completely preserved, and these younger subjects, operated on before vesical distention and considerable residuum occur, recuperate quickly, while their bladders are easily and completely emptied, and nocturnal micturition disappears completely or almost so.

However, the great objection which has been made to prostatectomy in younger men is the loss of the genital functions that may follow on account of laceration of the vasa where they cross the prostate, but from cases reported by several authorities it would appear that a certain reserve should be maintained in this respect. For example, Goodfellow has related several instances of patients who preserved their genital functions, and he even mentions the case of a man 63 years of age who had been for two years without any sexual desire, who after the operation found the desire returned, and persisted for five years. In another patient, 57 years of age, genesic power remained until the age of 65; other similar cases could be mentioned. However, besides these exceptional instances, it must be admitted that the operation results in more or less pronounced weakening of the function; erections are only temporary, occurring more especially at the time of micturition upon waking in the morning, and disappear after the bladder is emptied. It goes without saying that this question need not enter into consideration in the ordinary class of prostatics, because, on account of their age, the genital functions have disappeared; but in the cases which we are considering the disturbances produced in ejaculation should be seriously considered and may form a contra-indication. Whether the genesic power disappears or is only weakened, the patient should always be warned of this fact, but the number of those who desire to retain these functions is small, and in comparing the quiet of mind obtained by operation to the misery they are undergoing, most will, I believe, accept willingly the loss of what little sexual power they may still retain.

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A CLINICAL NOTE ON CYSTITIS OF GONORRHEAL ORIGIN.

BY A. W. MYERS, M.D., MILWAUKEE, WIS.

The medical treatment of cystitis is an unsatisfactory chapter in therapeutics. The application of remedial agents to the bladder by injection is considered the best method, if the cystitis is due to infection by a specific organism, as in the following case:

A traveling salesman, aged 27 years, unmarried, consulted for an acute attack of gonorrhea. He acknowledged having had several previous attacks, the last one dating back six months. It had been cured by ordinary methods. There was a profuse urethral discharge, but at this time no symptoms pointed to involvement of the posterior urethra. Four or five days later he returned and explained that his business had unexpectedly taken him into the country, where he had been obliged to take long rides over rough roads in cold and wet weather. After the first day of this exposure he began to have pain over the bladder and in the perineum, and the desire to urinate was almost constant.

Examination of the urine by the two-glass method showed both the first and second portions equally turbid. The urine was alkaline in reaction, contained a great deal of mucus and a large number of pus cells, but no albumin or sugar. The patient stated that every now and then, since his gonorrheal experience, he had noticed shreds in the urine. Digital examination through the rectum revealed a tender and somewhat enlarged prostate. The urethra was sensitive, particularly in the prostatic portion.

With these findings it was easy to make a diagnosis of catarrhal cystitis with acute exacerbation of a chronic prostatitis, undoubtedly of gonorrheal origin.

Hexamethylene tetramine in doses of five grains four times a day was given internally. The patient was put on a strict diet, ordered to drink large quantities of milk and water, all tea, coffee, spirituous and malt liquors were interdicted, and the patient advised to keep off his feet.

A solution of acetozone, consisting of fifteen grains to a quart of water, was made up, and the bladder was carefully irrigated with this solution after thoroughly cleansing the urethra. The solution of acetozone was instilled into the prostatic urethra. Both the solution in the bladder and in the urethra were allowed to remain for ten minutes. During this treatment the patient complained of burning sensations in the prostatic urethra, but this soon subsided after evacuation of the bladder. This local treatment was carried out on two successive days, and then the patient's business obliged him to go out of town. On his return, three days later, he reported that he had had no trouble since the last treatment and felt perfectly well, except for a slight urethral discharge and a little tenderness in the prostate. Examination of the urine showed the presence of a few shreds in the first portion, the second portion being almost clear. Palpation of the prostate showed it to be still slightly enlarged and somewhat tender, but very much less than upon the first examination.

The remaining history of the case is of no particular interest, except that convalescence was uneventful and led to complete recovery.

THE RELATIONS OF THE PHYSICIAN TO MODERN SURGERY.[1]

BY JOHN B. DEAVER, M.D.,
Surgeon in Chief, German Hospital, Philadelphia, Pa.

Mr. President, Members of the Stillé Medical Society, and Gentlemen:. Permit me in the first place to thank your patron for the honor he has conferred upon me, by extending an invitation, on your behalf, to address you this evening. I esteem such an invitation an honor, and a high one; not only because of the eminence of the speakers who have addressed you in former years, and of the distinguished prestige of your society itself, but also because an invitation extended to one whose entire life has been devoted to surgery seems, when coming from a society such as yours, to carry with it special dignity and opportunity. And if at first I felt reluctant to accept the kind offer thus made, feeling how inadequate are my talents for the duty proposed, it was with an overpowering sense of the opportunity afforded me that subsequently I signified my grateful acceptance of your invitation.

The privilege of addressing an audience composed of undergraduate members of a medical society bearing the illustrious name of Stillé, and founded in the halls of that alma mater so dear to us all, the University of Pennsylvania, is an opportunity which no modern surgeon could fail gladly to embrace. And it is because you have asked a surgeon to speak to you, and because you are undergraduates who will soon be granted the honored title of Doctor—or Teacher—of the healing art, that the subject I have selected for my remarks this evening has borne itself in upon me as one of eminent appropriateness to be discussed on this occasion.

In speaking then of the relations of the physician to modern surgery, I desire chiefly to call your attention to, first, the actual status of what we call "modern surgery," and the changes which the advances in surgery have brought about in the relation of the physician and the surgeon; secondly, the importance of diagnosis, and certain differences between diagnosis in medicine and diagnosis in surgery; and thirdly, the question of therapeusis by surgical means.

It is not necessary for me to remind you that the evolution of the surgeon as distinguished from the physician is a matter comparatively of recent years. All things are comparative, and when I say that surgery in contradistinction to medicine is comparatively of recent origin, I would not be misunderstood. In reality surgery antedates medicine. The Egyptians, the Trojans, and the early Greeks were surgeons rather than physicians; but as time went on surgery degenerated into cupping, and leeching, and cutting for stone, until, in the middle ages, and even up to the eighteenth century, medicine was a pursuit for gentlemen, and surgery was a trade for barbers. Thus, when that now venerable body, the College of Physicians of Philadelphia, was founded in 1787, not only was the word surgeon carefully omitted from its title, but the names of many surgeons of eminence and worth were conspicuous by their absence from its rolls. So conservative indeed was this body that no official recognition was accorded the surgeon as such until, at its Centennial Anniversary, in 1887, the most learned surgeon America has ever produced, the lamented Ashhurst, was invited to respond to the toast of "The Surgeon."

[1]Address delivered before the Stillé Medical Society of the University of Pennsylvania, March 2, 1906.

The surgeon, then, representing surgery, has been fighting his way industriously and by hard work against a none too complaisant and gracious body of medical men, until, at the present day, he bids fair to win the battle—shall I say to wrest supremacy from the physician? By thus representing the relation between medicine and surgery as a battle, I do not mean to include in the list of contestants such enlightened physicians as your patron. I regard him as one of the most progressive physicians in this city, if not in the whole country; and were it not for his presence to-night, I should feel myself at greater liberty to express my admiration for his abilities. With such physicians as he, surgery has no war; he and those like him are in our own camp, they know our lines of battle, and when they cannot overcome alone the common enemy—disease—they come to us for succor, and under like circumstances we gladly call in their assistance in our need.

You may understand, then, how the modern surgeon feels, when, having passed through the stress and storm of the centuries which have come and gone, he sallies forth upon the firm ground of the present, and like Israel of yore sees the Egyptians dead upon the seashore. He knows the intensity and the fury of the battles gone by, and he feels that what has been won must be kept at any cost; he is intensely in earnest in his work; he must keep himself in the vanguard of the fight with disease; and he must leave his surgical descendants fewer diseases to conquer, and fewer problems to solve.

This has been the attitude of the modern surgeon of every age; for every age has had its modern surgery. It may seem incongruous to some of you to hear a man who lived in the sixteenth century called the Father of Modern Surgery—yet such is the title which has always been given to Ambroise Paré; and well did he deserve it. But the modern surgery of to-day will be old-fashioned surgery ten years hence, and in some departments of surgery the advance is even faster. It is only the principles of surgery that are slow to change; and those that are true principles never change: the immobilization of fractures, early incision, and adequate drainage of pus collections—these principles are the same now that they were a century or two ago. The fashion of splints changes; we used to drain with poultices, or charpie, or tow; now we use rubber or glass tubes or gauze—these are practices, and are never constant from year to year.

The two factors which have wrought the greatest change in surgery within the space of two or three generations of human life are the introduction of anesthetics and the adoption of antisepsis. The study of the early history of each of these subjects is fascinating, but can be only briefly touched upon in an address such as this. We know that before surgical anesthesia from ether or chloroform was introduced many and various methods were adopted to relieve the pain necessarily suffered by patients during an operation. Opium, mandragora, and other narcotics were employed at times; partial intoxication was sometimes induced by alcoholic fluids; a semi-comatose state was secured by constriction of the great vessels of the neck; or the affected limb was rendered numb by pressure on its nerves. The inhalation of laughing-gas was a further step toward anesthesia by respiratory means; and finally, as you all know, nearly sixty years ago, in the Massachusetts General Hospital, occurred the first demonstration of the anesthetic effects of "sulphuric" ether.

Even so with the introduction of antisepsis. The medieval monks smeared the wounds of patients under their care with preparations of pitch—subsequently called "filthy applications"—and the wounds did well. No

one knew why these noisome applications proved beneficial, but the effect was evident, and the practice maintained. Later surgeons learned that wounds kept pure by the means of ordinary cleanliness did better, and suppurated less, than those in which no such precautions were executed; and soap and water, turpentine, alcohol, and permanganate of potassium were employed empirically for their cleansing and deodorizing properties. In the War of the Rebellion bromine acquired a well deserved reputation in the treatment of hospital gangrene—that great scourge of military surgery in preantiseptic days. Meanwhile, two score years ago, the experiments of Pasteur on fermentation, and the studies of Lister in antisepsis, gradually brought these heretofore crude practices into a more or less scientific atmosphere, and with the final adoption of sterilization by heat, wherever possible, and the employment of antiseptics when asepsis was impossible, surgery was advanced more in one generation than it had been through many centuries before.

Now all these various changes have altered very materially the attitude of the physician and the surgeon to disease, as well as their relation to each other. Before the days of anesthesia surgery was concerned largely with acute injuries, tumors, and stone in the bladder. Those were the days of the great military surgeons. The physician ruled supreme in diseases of all the internal organs. The surgeon did not know, nor was he expected to know, very much of internal pathology. He was called in consultation by the family physician only when some affection undeniably surgical was found. If there was an aneurism, the surgeon might be expected to perform Hunter's or Anel's operation. Varicose aneurisms following phlebotomy were frequent in those days. If a fatty tumor caused annoyance, the surgeon might be asked to excise it. Herniotomy for strangulation was a frequent operation; and the fitting of trusses formed not an inconsiderable part of surgical practice. If an old case of osteomyelitis went from bad to worse under the care of the family physician, the surgeon's kind offices might be required to amputate the limb. But when catarrh of the stomach, torpidity of the liver, or peritonitis was present, the surgeon had no place. Sometimes, indeed, when a patient with peritonitis did not die, an abscess might form, if what was considered the happiest of all terminations, the rupture of the abscess into the bowel and its spontaneous evacuation by the rectum, did not occur, and in that case point externally; and finally, when evidences of fluctuation were unmistakable, the surgeon might be invited to thrust his bistoury into it. But these were rare cases, and the average surgeon had little experience with them. The surgical affections of the kidney were unknown; the spleen was an organ never thought of but in connection with malaria; the liver was torpid or might be diseased in connection with gallstones. In any and all of these cases purges were administered, blood was let, or leeches were applied—and the *vis medicatrix naturæ* did the rest.

Toward the middle of the nineteenth century, operative surgery made notable advances, with the result that the surgeon was consulted more often as time elapsed, and other branches of medicine became amenable to surgical treatment. The course of genito-urinary surgery was immensely advanced by the introduction of Syme's and Cock's operations as well as by Bigelow's method of litholapaxy. Ovariotomy became a recognized operation. Perityphlitic abscesses were opened even before fluctuation was evident. And with the introduction of anesthesia every operative procedure was rendered safer and more thorough, while the general scope of surgery was ineffa-

B. J. C. D.

bly broadened. Cancerous and other tumors could be dissected out without the fear that some movement of the patient might any moment cause instant death from hemorrhage; excisions of joints and resections of bone, and sequestrotomy, became frequent procedures; plastic surgery saw its most palmy days; and physicians of the period who were aware what surgery could do hastened to send their patients to the surgeon for correction of deformities or ablation of disfiguring growths.

Nor did physicians find themselves with less to do on account of the invasion of their domain by surgery. Medicine advanced along its appropriate lines, and typhoid and typhus fevers became distinguishable, partly through the investigations of Professor Stillé himself; thus was hygiene advanced, and other infectious diseases were treated with greater attention and more rational means. The introduction of physical diagnosis by means of auscultation and percussion cleared up many obscurities in thoracic diseases—pleural effusions and pulmonary consolidation were recognized more readily; affections of the heart were systematically classified; and experimental physiology laid the foundation for rational therapeusis. It is curious to read in Dr. Parrish's biographical memoir of Dr. John C. Otto, who died in 1844, that "toward the close of life, edema of the extremities occurred, with great difficulty of respiration, which induced Dr. Hewson and myself" (Dr. Parrish), "his medical attendants, to suppose that hydrothorax had taken place, and we had little doubt that this condition was preceded by extensive organic disease of the heart, although no post-mortem examination was instituted to test the accuracy of this opinion"—statements which show the hampered state of medicine before physical diagnosis was understood. As thoracic disease came to the foreground, Estlander devised his operation for empyema; and thus it was that in no department of medicine was the surgeon found lacking, once the pathology and the diagnosis of an affection became thoroughly understood.

But the greatest change of all took place in the abdominal affections. From opening perityphilitic abscesses, surgeons strove for the prevention of these abscesses, and under the initiative and with the aid of such advanced clinicans as Matterstock in Germany and Fitz in America, showed that practically all acute affections of the lower right abdominal quadrant are due to disease of the vermiform appendix. In connection with this subject I think it may be of interest to you to be told that Dr. Stillé was endowed with so logical a mind that he was never willing to admit the existence of an idiopathic peritonitis. The róle the appendix plays in diseases of the abdominal cavity was not known in my student days; but Dr. Stillé, from the mere focus of reason, and by analogy, was so impressed with the necessity of a cause for every affection that, as I have said, he denied pointblank the existence of idiopathic peritonitis. He would wax eloquent upon the subject, and so impressed it upon his students that I doubt if ever a pupil of his left this university without being convinced that every case of peritonitis could be traced to some cause or other if he only knew just where to search for its origin.

Starting with the vermiform appendix and the region thereabout, other parts of the abdominal cavity have become amenable to surgical treatment. The pelvis and its destructive uterine growths, as fibromata and carcinomata, are entirely surgical to-day; the gall-bladder and biliary tracts were next transferred to the surgeon; and at present the treatment of diseases of the stomach, the duodenum, the pancreas, in fact the whole upper abdomen, is fast becoming surgical in its tendencies if not already so. Need I refer to the fact that nowadays the

diseased lung is successfully explored surgically, and that many patients ill with pulmonary abscesses and allied conditions are restored to health, while under the beneficent influences of medicinal measures they would inevitably have perished? And the really wonderful developments of the surgery of the nervous system are now a part of common knowledge.

Since, therefore, it is imperative that the surgeon and the physician be brought into more intimate contact, that they study many of their patients together, and since it is generally recognized that of many of the so-called medical diseases the appropriate treatment may become at any time distinctly surgical, it is pertinent to inquire what qualifications the physician requires of the surgeon he wishes to consult and what the surgeon desires of the physician that will study his patients with him.

That qualification which of all others I think physicians admire and respect most in a surgeon is *judgment*. It is a difficult quality to describe in words; but it consists essentially in knowing whether or not an operation is required in the case under consideration, in deciding upon the best time for performing the operation, and in selecting the special form of operation to be employed. Needless to say it is a difficult quality to acquire, and it is almost an impossibility for one surgeon to impart it to another. Although it may be developed, it appears in its origin to be largely intuitional; and those who are born without it rarely become distinguished for anything beyond the mere manual dexterity with which their operations are performed. The operations performed by such surgeons may be the most brilliant successes, but many of their patients are very apt to die.

The requirements which Celsus enunciated as being of the utmost importance in a surgeon were that he be "young" and that he be "pitiless." Now I beg of you to notice that the first of these is a quality of the body, the second a quality of the mind. A surgeon must be young. This is perhaps a difficult thought for any surgeon to entertain; for it is the natural course in every man's life to grow old, and age should bring added respect and prestige. Authority, says Cicero, is the apex—the culmination—of old age. But again I beg of you to notice that the surgeon must be young in body, not in mind. He must be pitiless in mind. That is not properly a quality of youth. Pitilessness is only developed in the stern school of experience. He who does not know the evil results which ensue when a surgeon is guided by his sympathies rather than by his intellect in deciding for or against a serious operation, or in limiting the thoroughness, the radicalness, of his operation, that man is not an experienced surgeon; his mind is young, though his body may be old.

It is narrated of Dr. Philip Syng Physick, the Father of American Surgery, and the first professor of surgery in this university, that in his latter years he not only became so sympathetic that he wept over his patients' sufferings, but that he could be prevailed upon only with the greatest difficulty to undertake any dangerous operation; and he was so prone to run away at the last minute, to avoid the dreadful ordeal, that it became necessary to guard him very closely to prevent him from escaping just before the time set for the operation. His mind had evidently outlived his pitiless stage, and though still strong and active physically, he was no longer young in one of the important senses of that word—his mind had ripened past maturity, and had returned to a condition of youthful impressibility.

That this quality of mind may react upon the body, and become a cause of physical indecision—a quality fatal to success in surgery—we see exemplified in many ways every day of our lives. The inability of certain men to step

on or off moving tram-cars, although they may be perfectly strong, and sound in physique, is oftentimes merely an evidence of senility of mind, which renders them incapable of the rapid coördination of movement requisite for this rather perilous procedure. I am not advocating such a habit, but it seems to me undeniable that the inability of some men to perform such physical acts is due rather to age of mind than to age of body. Occasionally we see a man who never develops this physical indecision though he live to eighty or ninety years.

Now a surgeon who retains his maturity of mind—neither youthfulness nor decrepitude—will remain young in the sense in which a surgeon should be young, long past the age when mere physical youth has passed. A surgeon, growing old in body, may become wearied after three instead of after five or seven hours of operating, but if he has not yet developed the physical indecision of the senile mind, he will still be young in the best sense of the word. On the contrary, many a surgeon is afflicted with physical indecision even in youth. He cannot meet emergencies as they should be met. While he hesitates between two or three courses of procedure his patient may die, and he will not realize until too late that it would have been better to have done the second best thing rather than to have lost the precious life entrusted to his care.

There are surgeons who possess to an eminent degree the qualification of judgment, who are nevertheless neither skilful nor particularly successful as operators; and there are also surgeons whose success lies primarily in their operative skill, but in whom judgment is lacking. They are not youthful in mind—they are immature; they are not pitiless—they are reckless.

The physician, then, as it seems to me, would do well to avoid referring his patients to a surgeon who is immature or reckless, but especially to one who is reckless. It is scarcely likely that a physician will be so unfortunate as to be unable to procure the services of a surgeon who has judgment and operative skill; and I cannot conceive of the circumstances in which he would be forced, as has been suggested, to obtain the opinion of a judicious surgeon as to the necessity and the scope of the operation, and to retain for the actual performance of the operation a surgeon who, though lacking in judgment, yet is able to carry out with success the technical details of an operation which has been sanctioned by superior authority. It is seldom, I fear, that the physician will be able to acquire for himself sufficient surgical judgment to render it safe for him to dispense with the opinion of a judicious surgeon and to permit him conscientiously to employ the operating surgeon as a mere machine in his own hands. The neurologists perhaps will go less astray here than the general physician, since they have preëmpted, as it were, the judgment and counsel of the surgeon—a fault which I regret to think is nearly as much to be blamed on the surgeon as on the neurologist, for there are few surgeons capable of meeting the neurologist upon equal ground in the matter of neurological diagnosis.

It is perhaps even more difficult for me clearly to express to you the characteristics and qualifications that surgeons desire and admire most in the physician. There are many. It is an attribute of human nature to desire, to covet, that which we do not possess, and many surgeons, mindful of, though they will not admit, their ignorance of pathology, demand of the physician an accurate knowledge of pathological processes, of the etiological factors, pathological physiology, and the natural course and tendencies of diseased processes. The surgeon expects also of the physician a diagnostic skill and acumen not inferior to his

own. These necessary attributes are generally recognized; but there is another important qualification desired of the physician by the surgeon which perhaps may best be expressed by the negative term "lack of prejudice." A physician should, I think, be thoroughly open to conviction; and not only should he be open to conviction by surgeons and surgery, but he should have such an attribute of mind as actually to desire conviction upon many points which in the past may have seemed to him problematical. Recognizing the value and the importance of medicinal measures, he must not overlook their very obvious limitations. Rationally basing his therapeutic measures upon his knowledge of the nature and natural tendencies of diseased processes and the power and effect of the medicinal measures at his command, he must not be unmindful of the progressive and irremediable nature of many diseased processes under medical treatment; he must remember that the natural course of many diseases is well known and definite, and that though this course may sometimes be influenced, shortened and often prolonged, by medicinal measures (well or ill directed), an aberrant course is often due to some complication of which the treatment is very frequently distinctly and imperatively surgical; and he must bear in mind the time for surgical intervention in many disorders and complications of disorders is early, and not when the patient has become exhausted by the devitalizing influence of the disease process itself, aided perhaps by many of the medicinal measures employed.

One of the qualities which, I believe, surgeons deprecate most in physicians is the habit which many of them practice at the present time of experimenting with almost every new remedy that is placed upon the market, often by our overzealous friends, the manufacturing chemists. Physicians of the widest experience have learned a fact which I venture to think the average surgeon learned long before, that the drugs which have distinct and valuable properties are so few in number as to be countable almost on the fingers of one hand. The present-day multiplicity of synthetic and extracted remedies is so bewildering that it would seem, indeed, as if there must have been devised a drug for very disease, even for every single symptom of the many diseases to which flesh is heir. But the surgeon looks with suspicion on these new remedies, and often for the reason that not only does he find no two physicians advocating and employing identical drugs, but that sometimes even the same physician who one month is loud in his praise of a particular remedy will be found a few months later to have discarded it, and to be lauding a new preparation, while he is decrying louder than any one else the drug about which shortly before he was so enthusiastic.

It must be evident to any one who considers the matter that the change in the relation of the physician and the surgeon to disease has brought with it certain changes in their relation to each other. The ever widening horizon of medical science has brought into view many diseases and numerous methods of diagnosis and of treatment which were totally unknown to our predecessors. As a consequence specialties have been developed, it being no longer possible for one man to become expert in all branches of medicine. The years are not so very remote when a surgeon operated as often and as skilfully for cataract as he did for stone in the bladder; or when a physician could as well treat a patient with pneumonia as he could analyze by chemical tests the mineral constituents of spring water. In the present advanced state of medical science, not only do its votaries devote their whole lives to some special region of the human body, as the eye, the heart, the stomach, or the

genito-urinary system; but we have also men some of whom are acknowledged past-masters as diagnosticians, and others who are specially skilful in the treatment of diseased affections the diagnosis of which they often find it safer to have made by some one else. Many physicians, moreover, who are skilful diagnosticians (and this seems to me particularly true of the neurologists), are content to make a diagnosis, and then have no further interest in the patient. The problem of localizing the lesion in the brain, and of studying the nerve paths by which its manifestations are brought about, possesses a sufficient fascination for them, and the question of treatment, which after all in neurological affections is still an almost unsolved puzzle, can in no manner captivate their interest. On the other hand, there are surgeons, and I regret to say that their number is increasing, who are content to take their diagnoses ready made by the physician, and who thus place themselves in another's hands merely to carry out, in a mechanical way, some accepted form of treatment for a disease they are unable to recognize unaided, with the expectation, however, of effecting the cure of a disorder of the evolution of which they understand not one single stage; nor can they tell when one form of operation is to be preferred to another. The pathological condition should be understood and as fully comprehended by the physician as by the surgeon, and both should be able to form a conception of the physiological and anatomical changes which will be produced by an operation or any other form of treatment which might be adopted. Two minds are always better than one, and the patient's safety is enhanced by a multitude of wise and experienced counsellors.

Many instances might be given of the dangers and the errors which result from a surgeon accepting a ready-made diagnosis. It is true, to be sure, that a surgeon who has made his own diagnosis before an operation is sometimes proved in error at the operation; but it seems to me that under these circumstances he is less morally culpable than is that surgeon who makes no attempt to reach an independent diagnosis. A surgeon who is assured by the neurologist that a brain tumor has been localized in a certain spot would feel less chagrined, and onlookers would blame him less, when no tumor is found at the operation, if he had first made satisfactory to his own mind the reasons for the diagnosis, and had not exhibited such blind and unreasoning faith in the neurologist's skill as to attempt an operation which, in his own conscience, had no reason for its performance. Similarly in the event of suspected perforation in typhoid fever. While denying that the mere suspicion of perforation is an adequate reason for operating in cases of typhoid fever, I do maintain that that surgeon is cowardly who refuses to act on the impressions received by his own senses and confirmed by his own experience, when the attending physician confesses his inability to say positively whether or not a perforation is present. I have known of a surgeon, called in consultation by a physician in such cases, who lacked decision of character to such a degree that, although convinced that a perforation was present and consent for operation was freely given by the patient and the physician, yet, merely because the physician could not satisfy himself that perforation had actually occurred, he declined to operate, and permitted the patient to die of peritonitis which he knew was present, but to attempt the cure of which he lacked confidence in his own judgment and resolution and firmness of purpose. The close relationship that must exist in modern surgery between the physician and the surgeon is not better exemplified than in the severe abdominal complications of typhoid fever —perforation, hemorrhage, appendicitis, and

cholecystitis. The surgeon should be familiar with the usual types of typhoid fever, and the physician should educate himself to recognize, by all the resources of the science and art of medicine, the very beginning of peritonitis from any cause. A surgeon who never sees a typhoid fever patient until perforative peritonitis is well advanced is unable to recognize a perforation in its initial stage, and he is also very likely to mistake for perforation many other painful abdominal conditions that occur during the course of typhoid fever. Similarly, a physician who never sees the abdomen opened and intra-abdominal collections of pus and feces evacuated is slow to recognize what is occurring within the abdomen of many of his typhoid fever patients. Hospital physicians do not resent the conscientious endeavors of their surgical colleagues to perfect themselves in the art of diagnosis in this difficult class of cases by making routine visits to the medical wards; and surgeons are only too delighted to convince their medical colleagues that an operation was actually necessary in the specific cases in hand by having them see *intra vitam* the pathological conditions within the abdomen. And it is in diseases such as these that early and accurate diagnoses are so essential, but at present so difficult to obtain. In no other realm of medicine, probably, should the association of the physician and the surgeon be closer than in the diseases of the upper abdomen, the stomach, the duodenum, the gall-bladder, and pancreas. Almost without exception these maladies begin in a form which is admittedly medical, and with almost equal frequency are they sure to terminate in a surgical affection. It is the task of the modern physician to determine at what stage of the disease the patient should pass from medical to surgical care, and until the physician is able to do this it is the function of modern surgery to take every means at its disposal to urge upon the physician the advisability, the absolute indispensability, of early surgical consultation.

Upon questions such as these the most progressive of physicians are practically in accord with the teachings of modern surgery; and I am happy to think that the members of the Stillé Society, as those of the University of Pennsylvania at large, are receiving every day the best and the soundest teaching of modern medicine. You have been taught to recognize the fact that the best, perhaps the only, way to cure carcinoma of the stomach is to cure the gastric disease which in the immense majority of patients precedes the development of gastric cancer. You have learned that gall-stones may be productive not merely of cholecystitis and other more or less local complications, but that they are in not a few instances the direct antecedent cause—the *fons et origa mali*—of gastric ulcer and of pancreatitis. You know that while ulcer of the stomach may kill by its acute complications—perforation and hemorrhage—which are admittedly surgical, there is a still larger and therefore more important class of cases in which the symptoms are always chronic, and which, because due to actual structural changes, can only be altered by mechanical means, which it is in the power of modern surgery to apply.

And you know, furthermore, that unless the surgeon is afforded the opportunity to correct these mechanical defects before autointoxication and inanition have produced wide-spread degenerations in the liver, the kidneys, and the cardiovascular system—you know, I repeat, that unless you obtain surgical aid in time, you will, by your hesitation and your indecision, be condemning to an early grave patients whom an early operation would in all human probability have restored to a useful life for many years to come. These facts, so all-important to-day, you have learned; and I beg of you, one and all, to go forth into your medi-

cal careers to teach others what you have learned here, and to save by precept and example the great horde of chronic dyspeptics from slow and lingering deaths under purely medical treatment.

Yours will be the opportunity of seeing these sufferers first; yours will be the chance to make an accurate diagnosis; and yours I pray may be the happiness of seeing restored to useful and profitable employment many a poor wretch whom your medical forbears would have drugged into a premature grave.

It had been my intention to say something this evening about certain differences between diagnosis in medicine and diagnosis in surgery. But as I stand here and look into the intelligent faces of so many physicians who are fast causing that difference to disappear, I doubt whether such remarks would be apropos. I have already referred to a class of physicians with whom diagnosis is an end in itself. They are those who tend to pure science; while some surgeons, on the contrary, are much more apt to care nothing for the diagnosis until they find that the operation they have performed fails to cure the symptoms of the disease. Such a surgeon as I describe is one who cares merely for the art of surgery, and absolutely neglects the science. Dr. Samuel Johnson, England's great lexicographer, has remarked that "the philosopher may very justly be delighted with the extent of his views, and the artificer with the readiness of his hands; but let the one remember that without mechanical performances refined speculation is an empty dream, and the other that without theoretical reasoning dexterity is little more than a brute instinct." So it is that diagnosis is equally reprehensible if, as in the extreme medical type, it becomes an end in itself, or if, as in the other extreme, it is obtained only by the therapeutic test of an exploratory operation. A surgeon who cannot decide whether or not a patient really has chronic appendicitis, and yet proceeds to do an appendicectomy as the easiest solution of the difficulty, will be no better off intellectually, and his patient will be much worse physically, when they both find that, subsequent to the successful operation, the same old symptoms persist as of yore; and in all probability the next step of that surgeon will be to remove the ovaries, to determine whether they were the cause of the disease. This procedure failing, the kidneys may next be sutured to the loin; and finally explorations of the upper abdomen will be in order, until at last by their negative results these therapeutic tests will have convinced the surgeon that none of the organs subjected to operation was really diseased, but that the patient was a neurasthenic, so-called—a conclusion which any intelligent physician could have reached before the first operation was undertaken.

So while we acknowledge that perhaps medicine is preëminently a science, and surgery an art, we must not fall in with Scylla while seeking to avoid Charybdis, we must not exclude science from the realm of surgery, nor art from the domain of the physician.

The tendency to neglect the art of medicine is seen in the too prevalent custom of making our diagnoses in the laboratory, while minimizing if not entirely denying the importance of the clinical history and the physical examination of the patient. Perhaps the surgeon is too apt to underestimate the findings of the laboratory specialists, but I think there can be no question that most young physicians have much too exalted opinions of the unerring exactitude of laboratory diagnoses, and are unaware of the humiliating and sometimes dangerous blunders into which some day they will be led by these methods. Indeed, it has long been my opinion that medical students are taught laboratory methods to an undue extent. The constant cry in all medical colleges at the

present day is for funds to build and to equip laboratories. The students are forced to spend hours at a time in the laboratories, studying the products of disease, or the causes of disease, while the time formerly allotted to the study of the disease itself is reduced to the minimum or is altogether expunged from the roster. Instead of drilling into the minds of students the eternal principles of medicine and surgery, the faculties of some of our higher institutions of learning are sending them into the laboratories with the end that they may become adepts in the art of blood-counting, or may be rendered capable of distinguishing between consanguineous tribes of microörganisms. This is a fatal mistake. The students will become perfectly familiar with the microscopical appearances of anthrax bacilli, of tubercle bacilli; will readily distinguish the colony of the streptococcus pyogenes from that of the staphylococcus albus or the colon bacillus; but they will not know a case of anthrax when they see it, they will not be able to distinguish between a phthisical lung and an acute bronchitis, they will not know an abscess from an aneurism, a sarcoma from a gumma, nor a case of erythema nodosum from simple bruises on the shins. I pray you to avoid these errors by not raising the science of medicine as we know it to-day on a higher pedestal than the art.

Physicians as a class are wofully deficient in that gift known to surgery as the *tactus eruditus*. This failing is encouraged by reliance on laboratory methods, and by neglect of physical examination, which, when often repeated, alone can develop the requisite delicacy of touch. In cases of appendicitis, for example, the attending physician will be worrying his head about the leucocyte count, and will possibly say to the surgical consultant that he thinks no pus has formed yet, or that he fears suppuration is impending; yet when the surgeon only so much as touches the abdomen he will recognize at once the presence of an abscess which had entirely escaped the grosser senses of the physician. The conscientious physician who recognizes his own shortcomings in a surgical sense quite as acutely as does the surgeon in certain medical matters will be anxious on this account to have surgical counsel at the earliest possible moment in the case of any patient who presents symptoms even suggesting a surgical complication.

Diagnosis, however, though of paramount importance, is relatively useless unless something can be done to cure, or at least to relieve, the disease. It may be of value to the patient to know that he is suffering from a heart lesion which may suddenly terminate his life at any moment, or that he harbors in his internal organs a malignant tumor which cannot have its course altered by treatment of any kind; but such knowledge on the physician's part does not advance the science or the art of medicine one jot or tittle. Hence it is that with every diagnosis the medical man must aim to elaborate a form of treatment, that these two factors, diagnosis and therapeusis, may supplement each other and so make four-square the science of the healing art.

The physician, then, must not be content to rest on his laurels after a difficult diagnosis has been made. He must be aware, in fact he must make himself conscious, that in these early years of the twentieth century surgery offers, and in some instances almost guarantees, a cure of affections formerly considered purely medical, and which, so long as they remain exclusively medical, are necessarily incurable. He should be progressive in his therapeutics; he must not rest content with the methods he has inherited from his forefathers, but he should be ever on the lookout for real and permanent advances in the healing art.

As I have pointed out on other occasions,

there are scarcely any permanent organic changes, except perhaps some of those that develop in the course of tertiary syphilis, that can be removed by the use of drugs. Leaving out of consideration the many infectious diseases, the chief object of medicinal measures may be said to bring about such an adaptation of the damaged to the healthy tissues that the animal organism may continue its life as little hampered and distressed as possible. The manner whereby this is accomplished need not detain us here; but I may point out that the more we learn of the physiology of the individual cell, and the better we understand its life processes in health and in disease, the more firmly does the conviction force itself upon our minds that drugs are powerless to absorb neoplasms or to cause the regeneration of needful parenchymatous tissues in lieu of substituting scar tissue.

Need I point out then that the best endeavors of the physician, and of the surgeon as well, should be directed to the recognition of neoplasms at the very beginning of their growth? Every neoplasm at first is a purely local growth, but so soon may the lymphatics become involved that occasionally the clinical manifestations of the tumor and metastases seem to be almost concurrent. In the majority of cases, however, this is not so; and carcinoma of the breast may be excised before the axillary glands have become involved; carcinoma of the intestines may be removed while it is purely local; and carcinoma of the stomach may sometimes be cured by the surgeon, and it cannot be cured at all by the physician. It is needless to multiply examples, but I should like to emphasize the fact that the early recognition of carcinoma of the stomach should become one of the chief concerns of the physician. In the natural course of events it is the physician who first sees the subject of carcinoma of the stomach, and it is he who must so perfect his diagnostic armamentarium that he can refer his patient to the surgeon at a time when the disease is still remediable. It is essential also that the physician bear in mind the difference between the hazard, and the likelihood, celerity, and permanency of cure of gastric ulcer under medicinal as contrasted with surgical treatment. The many communications in the recent literature bear ample testimony of the importance of this subject, and, together with my own experience, confirm me in the opinion that rest and drainage of the stomach effected by means of a well executed gastroenterostomy is the best means yet devised for the cure of gastric ulcer, and the best means also of preventing recurrence, serious if not fatal hemorrhage, perforation and consequent usually fatal peritonitis, and the ultimate development of carcinoma in the ulcer of its scar.

A final example of the futility of medicinal treatment may be cited: the medicinal treatment of gall-stones, and its many complications. He who is versed in the pathogenesis and pathology of gall-stones knows that they are insoluble in the bile and that the biliary ducts are impassable to the vast majority of gall-stones. Why, therefore, attempt to dissolve them by medicinal means and to cause their forced passage through almost if not wholly impassable ducts? And why persist in medicinal measures, which we know not only do not cure in the great majority of cases, but also rather favor the development of chronic inflammatory processes in and about the biliary ducts and add to the seriousness of an already serious condition? Is it not much better to remove the stones early, and by drainage of the gall-bladder effect a cure of the catarrh, the basis of the gall-stone formation? On the other hand, the minds of medical men should be disabused of the idea that the only form of surgical treatment available for their patients is operative in character. Though surgeons

are proud to consider an operation the highest function of surgery, yet they are duly thankful that there still exist many surgical diseases which can be cured without resort to the knife. Apart from the large department of orthopedic surgery, where, by proper exercises and apparatus, much good of a lasting character may be accomplished without operation, and apart from such surgical diseases as caries of the spine and coxalgia and other forms of tuberculous joint disease, there still exist, and probably will continue to exist, many patients with diseases of such a nature that they are best treated by surgical means other than operative. Genito-urinary affections in the aged, such as enlargement of the prostate, chronic cystitis, and pyelitis, are many times much more safely treated without any form of operation; and physicians should appreciate this fact. They must not think that a surgical consultation necessarily means a surgical operation; and they should realize that a surgeon may be able to give from his experience certain advice as to diet and mode of life which it would not have occurred to the physician to suggest; that the surgeon may even be familiar with some drug or combination of drugs which will modify the course of the disease, although prescriptions by the family physician have failed to bring relief; or that finally, by some simple change in or modification of the instruments used for catheterization or drainage, which would occur only to the surgeon's mind, the comfort of the patient may be very materially enhanced.

Varicose veins, hemorrhoids, and leg ulcers form another class of diseases of a surgical nature which the physician sometimes finds it difficult to treat. Under such circumstances he should not assume that the only remedy a surgeon could suggest would be some form of operation. By a change in the dressings of the ulcer or by some other method of applying the same dressings, such as the skilful application of a bandage, the ulcer may be made gradually to heal, or at least to cease to give annoyance. By detecting a hernia, or some other form of obstruction to the venous current, and by the application of a suitable truss, the varicose veins might be relieved by a little surgical acumen without resort to operation; and even hemorrhoids have been cured by the surgeon with neither ligature nor cautery.

In the great class of inoperable malignant growths, whether primary or recurrent, minor surgery and phototherapy may do much to relieve the sufferings of the patient even though no cure can be expected.

As I have intimated, I might multiply examples, but I have doubtless said sufficient to convince one that the physician and the surgeon bear a much different relationship to each other than they did several decades ago. Both have profited much from this changed relationship, but the patients have profited most. As the surgeon advances his art and increases his technical skill, the physician must advance in his therapeutics and be ever alive to the many dangers that threaten his patients—dangers necessarily fatal under medicinal measures, but more or less readily curable under the healing influence of the scalpel. The surgeon insists upon the early recognition on the part of the physician of surgical complications of any diseases, and upon the acknowledgment by the physician that many of these complications are not medical but surgical, and to be cured only by surgical means. When this recognition and acknowledgment shall have become more universal than they are, then will the physician and the surgeon stand as exponents of that reciprocal relationship that medicine should bear to her handmaiden surgery; then will surgery no longer be looked upon as the despair of medicine.

So that perhaps the burden of my remarks

this evening may be summed up by saying, Let the physician have confidence in modern surgery. Let him not distrust it. Let it be his aim to learn what is being done by surgeons for diseases formerly considered medical; and let him not be deterred by any fancied jealousy from recommending surgical treatment to his patients when he becomes convinced that surgical treatment will benefit them more than will medical.

The fight of medicine with disease is a never ending one. We may gain a battle here and there, and set up our standards of victory at one new outpost after another; but death is the end of all, and our utmost endeavors do but suffice to defeat him for a time, or to render less painful the premature departure of some loved one whom we cannot snatch from his grasp. And in this lifelong warfare the physician and the surgeon should go out to battle side by side, each arrayed with his appropriate weapons, and by never failing encouragement and mutual assistance enlarge the realm of medical science—so that when the grim Reaper calls them one by one to his fold, in response to the will of the Fates, there may be truthfully inscribed upon their tombs the highest praise that can be bestowed upon a mortal: "He loved and feared his God, and served well his fellow-men."

Thyroid Extract in Advanced Life.—

Deficiency in the action of the thyroid glands has been principally observed during the period of growth. Its characteristic appearances have been described under the term myxedema. Under the title thyroid extract in certain forms of chronic rheumatism Paul Claisse (*La Clinique,* Jan. 5, 1906) writes of certain cases which resemble myxedema occurring in the aged. They are commonly classed as gouty or rheumatic, though the symptoms clearly point to some other constitutional state if blood-pressure is below normal and there are none of the signs which commonly accompany increased arterial pressure. The joint changes are clearly degenerative in character. Such patients are frequently dull mentally, having a flabby obesity, the urine is scanty in quantity, and the urea is below normal. A clinical trial of thyroid extract in these cases demonstrated the analogy with myxedema. Under it there was an improvement in vascular tension, the skin regained its tone, the flabbiness disappeared, and in some cases in which there was sugar and albumin in the urine these substances disappeared. Patients while under the thyroid medication should be kept under close observation, as the pulse is liable to go up, and the dose of the thyroids should be regulated closely by the symptoms.

Refrigeration of the Spinal Nerves in Herpes Zoster.—

Vergely (*Rev. de Med. y Ciruj. Prácticas,* November, 1905) recommends the refrigeration of the affected spinal nerves in herpes zoster. A case is reported which was suffering from a marked form of the disease, and the pain and discomfort was excruciating. The usual applications, such as alcohol covered by cotton-batting and oiled silk, gave no relief. An ethyl chloride spray was then applied to a region corresponding to the exit of the upper eight dorsal nerves. The application was pushed to the point of causing refrigeration of the surface. It was followed by a prompt disappearance of the pain. No more vesicles formed, and those which were in process of evolution promptly dried up and desquamation took place.

BOOK REVIEWS.

CASE-TEACHING IN MEDICINE. By Richard C. Cabot, A.B., M.D., Boston. D. C. Heath & Co., 1906. Price $1.50.

It seems to the reviewer that the case system of teaching medicine is destined to find a place in the modern medical curriculum. Within the last twenty-five years the system of teaching medicine has undergone radical changes, due to the changes in medical science. The old didactic method of teaching was well adapted to a time when medical science was based on pure empiricism and the application of certain theories which had little foundation in experimental data. The advent of more exact methods required the addition of laboratory teaching, and this supplemented by clinical work left little room for the didactic lecture. The purpose of the clinic and laboratory is to develop the observation of the student and to store his mind with facts, but the reasoning powers are not stimulated. A diagnosis is based on an assemblage of symptoms and requires the highest development of the reasoning faculties. It is this that case-teaching aims to develop, and for this purpose it is an improvement upon the didactic lecture or upon the ordinary quiz. The place which case-teaching is intended to fulfil in the medical curriculum is well stated in Cabot's introduction. He says that the most important knowledge for the medical student is how to recognize the physical signs of disease, and these must be learned from the contact with patients. These data, however, must be interpreted. They do not crystallize spontaneously into conclusions. They do not arrange themselves into those significant groups which we call diseases. They have to be worked up into diagnoses by a reasoning process, and this reasoning needs practice. A man may collect with accuracy and thoroughness the data of the history and the physical examination, and then find that he does not know what they mean. For this secondary and relatively easy step one does not need the actual presence of a patient. With a book and a teacher it can be learned anywhere and at any time as well as in the clinic. It is easier to concentrate attention upon memory, comparison, and exclusion in the absence of the patient.

The object of the book is to enable the teacher to train his pupils to think clearly, cogently, and sensibly about the data gathered by physical examination. The case histories which the writer has gathered number 78, and are selected from a much larger number. They have been used in the actual instruction of pupils according to this method, the plan having been in vogue in the Harvard Medical College for the past eight years.

The advantage claimed for the student in this method of instruction is the wealth of material that can be employed, which is presented precisely as it is met with in practice. The cases can have certain portions omitted, so that they can be blind and puzzling as they would have been in actual practice had the physician forgot to look for and record certain essential facts.

From the standpoint of the teacher the method has many advantages, as in this way a large class of students can be actively busy. They are not merely listening or watching, they are doing the work of construction themselves. In case-teaching the class does the work, and not as in didactic work, where the lecturer performs the work and the class listens.

In using the cases it is advised that the teacher first read aloud the case to be discussed while the students follow in their case-books, from which the diagnosis and answers to all questions are omitted. As the teacher reads he should comment on or explain the text so as to make its meaning clear. A member of the class is then called upon by name to summarize the case, point out whether it is acute or chronic, and what organs or systems are especially involved. The students are then given five or ten minutes to think over the case, and then each writes, signs, and hands in a tentative diagnosis, possibly with one or two alternatives, on a slip of paper. Each man is thus forced to commit himself before he hears the case discussed. The teacher writes the plausible diagnoses upon the blackboard. Beginning with the least accurate he calls upon the man who has suggested it to give his reasons for it. Then the class is asked to bring up the points against it. If the objections are fatal this diagnosis is scratched off the list; if not, the question is left open until the other diagnoses have been discussed. The teacher then announces the true diagnosis as proved by operation, necropsy, or the course of the symptoms. Prognosis is next talked over. Case-teaching encourages questions on the part of students which other students should be called upon to answer, never the teacher, unless no one in the class is able to answer.

The case histories which the author has collected were nearly all confirmed by autopsy or operation, hence they have a rather somber character. But this is necessary where accuracy is aimed at. Some of the cases are rare, but they deal in many instances with symptoms which are found in the commoner diseases.

We should like to review some of the cases which make up the body of the work, but the space at our disposal is too limited. In this volume, which is

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designed for the teacher, not only is the case history given but also the questions and answers. The latter are to be omitted from the book intended for students. It is to be hoped that this work of Cabot's will secure a more extended trial of case-teaching in medical schools.

THE EXAMINATION OF THE FUNCTION OF THE INTESTINES BY MEANS OF THE TEST DIET. By Prof. Dr. Adolf Schmidt. Translated by Charles D. Aaron, M.D. Philadelphia: The F. A. Davis Co., 1906. Price $1.00.

This monograph had its origin in a series of lectures delivered in 1903. For eight years the writer had been working on the problem of how to investigate the functional activity of the intestines. He had sought earnestly to obtain a method that could be carried out in practice that would give results such as are reached in the examination of the stomach contents after a test meal. The work has appeared from time to time in different communications to medical journals, and while it is still far from complete he desired to put it into a single volume and to simplify the method so that it may be made useful in practice. He has the conviction that the functional examination, though still having many gaps, can be of service to the practitioner.

Since 1884 Nothnagel has urged the examination of the feces, though the method has not been as extensively employed as it would otherwise have been, due to the fact that the methods are cumbersome and difficult of application. The fecal masses are so altered by the diet that it is necessary in any investigation of the intestinal tube to study the feces after a diet containing known constituents. The writer's diet consists of 1.5 liters of milk, 100 grammes of zwieback, two eggs, 50 grammes of butter, 125 grammes of beef, and 190 grammes of potatoes, and gruel containing 80 grammes of oatmeal. Such a diet suffices for each day, the meat being given at noon, and the milk and oatmeal gruel for the morning meal and for supper. If the motor activity of the intestinal tube is good, ordinarily the second stool will contain the constituents furnished by such a diet. The recognizable characteristics of a stool under such a test diet are a light-brown color and uniform consistency. The examination of the stools should be made as soon as possible. After determining the consistency, color, and odor, the macroscopic examination, which is the most important, is made. For this purpose the stool is first stirred up thoroughly with a wooden spatula, then a small amount about the size of a walnut is transferred to a glass mortar, in which it is ground up as fine as possible with a small quantity of distilled water until it has a fluid consistency. The ground specimen is then spread over a flat black plate or a large glass vessel in as thin a layer as possible. Such a method is far superior to washing through sieves, which only reveals parasites or gall-stones. The macroscopic examination reveals mucus if present in larger or smaller flakes, though the mucoid characteristics may be obscured by coloring with bile or adhering extraneous matter. Remains of undigested food, such as tendon fibers, muscular tissue, portions of potato, and crystals of ammonio-magnesium phosphate are found to have a significance in the diagnosis of intestinal states. The microscopic examination rarely furnishes facts that have not been suspected by the naked-eye inspection. The only chemical examination that should be made is in taking the reaction with red and blue litmus, applying the sublimate and fermentation test, which last is the most important.

With these simple directions the author proceeds to consider the significance of the various findings, such as insufficient digestion of fat and meat. If macroscopic muscle remains appear in the feces it is a sign of insufficiency of the small intestine. If connective tissue remains are found it is a sign of stomach indigestion. If albumin putrefaction occurs with the fermentation test the inference is that there is a severe disturbance of digestion commonly associated with anatomical alterations in its structure.

The remaining portion of the work discusses the treatment of the various types of intestinal disorder. The volume contains an extensive bibliography and an excellent index. It belongs to the class of monographs of which we have too few in American medical literature.

PROGRESSIVE MEDICINE. Edited by Hobart Amory Hare, M.D., Assisted by H. R. M. Landis, M.D. Philadelphia and New York: Lea Brothers & Co. Price $6.00 per annum.

This is No. 1 of volume 8 of the Progressive Medicine Series. The first 136 pages are devoted to Charles H. Frazier's careful review of the literature of the surgery of the head, neck, and thorax. R. B. Preble in discussing the infectious diseases says that there are certain striking peculiarities in the recent literature on these topics, the most conspicuous of which is the paucity of articles which mark an advance in knowledge. Many of the articles have been detailed considerations of well known phases of disease such as perforation in typhoid fever. Two years ago the literature was full of the subject of tetanus. Last year a few articles appeared, while this year almost nothing has been written. Why this should be so is difficult to say, as the last word in regard to tetanus has not been said. He hopes that Behring's announcement of a cure for tuberculosis which has attracted so much attention will be worthy of the amount of time put in on it. In referring to the typhoid and pneumonia commissions he expresses the hope that the data will be so condensed in the form

of conclusions that it may be available without reading the immense description of the material on which it is based. In the literature of the current year Preble says that pneumonia has received less attention than formerly, and he is amused by the provincialism which often characterizes German and French literature. They ignore as long as possible all facts stated by others than their own countrymen. It is interesting to see them publish cases of pneumococcus septicemia and drawing conclusions as to prognosis from the presence of pneumococci in the blood, apparently ignorant of the fact that pneumonia is always a septicemia and that pneumococci are always present in the blood. F. M. Crandall refers to the tendency in pediatric literature to emphasize dietetic and hygenic measures in the management of infants. These views have recently been expressed by Holt, who believes that dietetics and general hygiene are the two important factors in the treatment of sick children. In the treatment of intestinal disorders the essential factors are evacuants, diet, and rest. In the chronic disorders of older children a careful dietary is the only treatment that will give permanent results. The neuroses are largely the result of impaired nutrition, and, like in the acute diseases, the body should be made more resistant. D. B. Kyle discusses submucous resection of the cartilaginous septum, which has attracted so much attention during the last year. His general summary of the situation is that while authors are contending for their particular modification of the operation the underlying principles of removal of redundant tissue and correcting the angular deformity and leaving a smooth mucous membrane on each side are the same in all classes. B. A. Randall discusses otology.

Diseases of the Eye. A Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. de Schweinitz, A.M., M.D. Fifth Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders & Company, 1906. Price $5.00.

The earlier editions of de Schweinitz's work have been so exhaustively and thoroughly reviewed in these pages that it would be superfluous to give it an extended review. It is one of the best text-books on diseases of the eye, and is a splendid example of what a text-book should be. There is very little in modern ophthalmic literature that a student should know that is not found in these pages. To give some idea of the "up-to-dateness" of this last edition, the following paragraphs appear for the first time: Solid Edema of the Eyelids; Noma of the Eyelids; Blastomycosis of the Eyelids; Herpes Facialis of the Eyelids; X-ray Treatment of Epithelioma; Xeroderma Pigmentosum; Influenza Bacillus Conjunctivitis; Catarrhal Epidemic Conjunctivitis; Purulent Conjunctivitis in Young Girls; Non-specific Purulent Conjunctivitis; Jequiritol and Jequiritol Serum; X-ray Treatment of Trachoma; Conjunctivitis Nodosa; Serum Treatment of Infected Corneal Ulcers; Infected Marginal Ulcer (Zur Nedden); Keratitis Marginalis Superficialis (Fuchs); Keratitis Punctata Syphilitica (Mauthner); Peripheral Annular Infiltration of the Cornea; Annular Scleritis; Uveitis and its Varieties; Circumscribed Plastic Choroiditis; Fatigue Contractions of the Visual Field; Eye-ground Lesions of Hereditary Spyhilis; Macular Atrophy of the Retina; Congenital Total Color-blindness; Congenital Word-blindness; Methyl-alcohol Blindness; Training of the Fusion-sense with Worth's Amblyoscope; Stovain, Alypin; Motais's Operation for Ptosis; Kuhnt-Müller's Operation for Ectropion; Haab's Method of Removing Metallic Foreign Bodies from the Interior of the Eye; and Sweet's Method of Localizing Foreign Bodies within the Eyeball with the Roentgen Rays.

A number of new illustrations have been added to the last edition.

A Treatise on Surgery. By George Ryerson Fowler, M.D. In two imperial octavo volumes, of 725 pages each, with 888 text illustrations and four colored plates. Philadelphia and London: W. B. Saunders & Company. Price, per set, $15.00.

This is the most striking contribution to the literature of surgery that has appeared by an American author in recent years. We have before us volume one, which deals with general surgery, including inflammation, tumors, surgical diagnosis, operations, and anesthesia. This takes up about one-half of the book, the remainder being devoted to a study of the surgery of the head, neck, and thorax. The work is essentially modern and practical, dealing with surgery as it is practiced to-day by the best teachers. Throughout special attention has been given to diagnosis, and the text is elaborately illustrated with new and original drawings, no expense being spared.

Text-book of the Materia Medica, Therapeutics, and Pharmacology. By George F. Butler, Ph.G., M.D. Fifth Edition, Thoroughly Revised and Rewritten by Smith Ely Jelliffe, M.D., Ph.G. Philadelphia and London: W. B. Saunders & Co. Price $4.00.

Butler's Materia Medica has been before the profession for a number of years, and its various editions have been favorably received by the profession. It was written by a teacher who had long practical experience in the instruction of undergraduates. The remarkable developments in the last few years have necessitated thorough revision and in part rewriting of the book. This revision has been undertaken by Jelliffe. That it is essentially a book for students and practitioners has been kept closely in mind. Especial attention has been

given to the toxicology of the newer compounds recently introduced into medical practice. The therapeutic recommendations in the last edition have been carefully revised and the arrangement so changed that those drugs whose predominant action is on one system of organs are grouped together, thus suggesting their therapeutic association. Jelliffe recognizes that any system of grouping has its drawbacks and defects, a subject which has been fully discussed in reviews of works on materia medica in these columns. The work has been somewhat reduced in size by the use of a more compact type and by the elimination of much material from the chapter on serum therapy. Much of the latter belongs to works on pathology, and only those features have been retained which are of importance in modern therapeutics. The work has been brought up to date and has been made to accord with the last edition of the Pharmacopœia.

TEXT-BOOK ON THE PRACTICE OF GYNECOLOGY. For Practitioners and Students. By William Easterly Ashton, M.D., LL.D. Second Edition. Philadelphia and London: W. B. Saunders & Co., 1906. Price $6.50.

That a second edition of Ashton's work is required within the short period of six months shows the appreciation with which it was received by the medical profession. It is a work that peculiarly appeals to the general practitioner and not to the expert gynecologist, as each subject is considered in detail, describing not only what to do but how to do it. Comparatively few changes have been made, as such a short time has elapsed since the first edition appeared. The work contains 1079 pages with 1046 illustrations, all original line drawings made under the author's personal supervision. It is to be hoped that the favor with which the first edition was received will be repeated with the second.

REFERENCE HANDBOOK OF THE DISEASES OF CHILDREN. By Prof. Dr. Ferdinand Fruhwald, Chief of Clinic in the Vienna Policlinic. Edited with Additions by Thompson S. Wescott, M.D., of the University of Pennsylvania. Philadelphia and London: W. B. Saunders & Company, 1906. Price $4.50.

There is a varying conception of what is understood by the term "handbook." It has been applied to small books which can be held readily in the hand, and also to reference works of encyclopedic dimensions. The term reference handbook is probably used to designate this work because of the arrangement, which is that of a dictionary, the subjects being arranged in alphabetical order, beginning with abscess and terminating with zona. Such an arrangement makes it unnecessary to have an index or table of contents. It is a work of 533 pages and contains 176 illustrations. The alphabetical arrangement necessitates many cross-references, which makes the work easy to consult. Such an arrangement is obviously better adapted for one who is well grounded in pediatric literature than for the undergraduate. The translator in the preface says that the original text has been closely followed. When it became necessary to harmonize the text with American pediatric experience the editor has used brackets to indicate the interpolations. The author's therapeutics have been presented substantially without change, and the work is thus a complete epitome of pediatric therapeutics as at present in vogue in Vienna. The author says that the compendium is not designed to take the place of a text-book, but it is intended to prepare and stimulate the student for the study of text-books and to serve as a convenient clinical guide. The work is well issued by the publishers.

NASAL SINUS SURGERY WITH OPERATIONS ON NOSE AND THROAT. By Beaman Douglass, M.D. Philadelphia: F. A. Davis Co., 1906. Price $2.50.

The author has produced a book of 260 pages dealing almost exclusively with operations on the various sinuses connected with the nose. The work opens with a careful review of the anatomy of the nose, and then there is taken up a discussion of the frontal sinus. A considerable number of plates are introduced illustrating the size and relation of the sinus, and made from photographs of bony dissections. The various operations are fully described. There is a full description of the ethmoid sinuses, their relation to the nose, and the method of reaching them when they are involved. In describing the antrum the author calls attention to the varying relation of the roots of the first molar teeth to the floor of the antrum. This plays a very important part in the diseases of that structure and in the methods of treatment. A very full account of the sphenoidal sinus and the method of treating it in disease is given. In addition to operations on the sinuses the writer has described the treatment of deflections of the nasal septum, external operations for the relief of deformity, turbinectomy, as well as operations on the tonsils, adenoids, and uvula. The work will be found to be a distinct contribution to the literature of laryngology and rhinology, dealing as it does more fully than the average text-books with operations on the nasal sinuses.

ABSTRACTS.

THERAPEUTICS.

The Open-air Treatment of Tuberculosis.—

GRIFFIN, W. A. *Boston Medical and Surgical Journal,* vol. cliv, No. 11, p. 288, March 15, 1906.

The out-of-door, milk-and-eggs treatment has been so thoroughly tried that it has practically displaced drugs and specifics in the treatment of this disease. Even climates have been relegated to the second or third place, though this influence cannot be entirely counted out, especially in selected cases. This treatment has been aptly called "elaborated common sense." The value of bacteriological products is still uncertain. It is possible that in time some serum therapy may ultimately be accepted as useful, though it probably will never displace hygienic living. The three essentials of the present-day treatment of tuberculosis are fresh air, good food, and carefully regulated exercise. It matters little how these things are obtained. A patient may be treated on a housetop or in a tent or in a shack in the back yard, or he may be the inmate of a well appointed sanatorium. If the air is fresh and pure the possibilities are as good in one place as in another. It is an advantage if the air is dry, the soil porous, the site somewhat elevated above the sea, and the temperature equable, but good results can be obtained in a poor environment, such as is found in large cities or near the coast. The nearer the treatment is kept up twenty-four hours out of the day the better. It is not sufficient that the patient spend his days out-of-doors and sleep at night with the windows closed, nor should the patient work by day if it can by any means be avoided and take the air only by night. It is impossible to give an overdose of fresh air, and the ideal arrangement allows only the sky for a roof at all times, and only so much shelter as is necessary to keep out the wet. All sorts of shelters have been devised, but the simplest device is usually the best. Cold weather is no hindrance providing the body is properly clothed. All consideration of personal appearance must be put aside. In sitting outdoors with the mercury at zero it is necessary to wear more than one suit of underclothing at a time, and the feet must be protected by two or three pairs of stockings. Heavy shoes or overshoes must be worn, or still better old-fashioned felt shoes. The bed must have a heavy blanket over the mattress, for much cold will come from below. A blanket should be laid loosely between the sheets, so that the body may be rolled in it. A sleeping bag may be useful. Hot-water bottles and a nightcap are not to be neglected.

In feeding patients no fixed rules can be laid down. If the stomach is forced too much it may rebel. Patients should always be urged to eat more than they want, and with moderate forcing of the diet the gain in weight and strength is on the whole as satisfactory as when patients are stuffed. At the Sharon sanatorium food is given seven times a day. Most diet tables for consumptives contain an excess of fat, but at Sharon there has not been any special effort to administer fats, and the gains have on the whole been satisfactory. The object to be gained is a moderate increase of body weight over what would be normal for the individual, and when that object has been attained the amount of food should be cut down, as certain patients can gain in flesh and still lose ground. The use of eggs may be overdone, with the effect of bringing on a loathing for this article of diet. As a rule

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three or four a day may be given without developing a distaste for them. Milk is the most important single article of food. From one to two quarts a day should be given.

The regulation of exercise is most important. The majority of phthisical patients feel so well that it is hard to keep them within bounds. Even patients with temperature are not sick enough in their own opinion to stay in bed, and after they have so far gained in strength that they may be allowed to go about it is even harder for the physician to hold them in check. A slight increase in the amount of exercise will at times be the turning point and send an otherwise favorable case down-hill. A few such experiences may make one overcautious, but it is well to remember that few are injured by rest. A patient with fever is as a rule better off in bed, but such confinement may be very irksome. Patients with advanced signs in the chest may have to be kept as long as two months in bed. When the patient is convalescent walking is the best and most easily regulated exercise. These walks should be prescribed as carefully as medicine. Two short walks are better than one long one if there is any tendency to weariness. If the patient gains in strength, the amount of exercise can be increased. Not until the disease is cured should more violent sports, such as tennis or rowing, be permitted. Patients may be injured by sewing or knitting if they keep too steadily at it, and it is well for all patients to have a rest each day of at least two hours.

The question of pulmonary gymnastics is still unsettled. In rapidly advancing cases deep breathing should not be used, nor should it be employed if there is pleurisy. In other cases there can be no objection to moderately deep breathing, as in this way the lungs are better ventilated and the secretions are gotten rid of by the pump-like action of the bronchial muscles.

Pulmonary tuberculosis is essentially a curable affection; the majority of cases will get well if taken in the incipient stage. The treatment must be closely supervised, and the details modified from time to time to suit individual needs. It will not do to instruct patients generally that they are to live out-of-doors and to take milk and eggs. Every detail of the treatment must be gone over repeatedly. The best interests of the patient are served by spending a time in a well conducted sanatorium at least in the beginning. Here he learns the necessary details in a way that would be impossible for him elsewhere.

Refraction Without Cycloplegia.—

SPRATT, C. N. *Journal of the Minnesota State Medical Association,* vol. xxvi, No. 6, p. 114, March 15, 1906.

It is claimed that with intelligent adults subjective methods of refracting are preferable to objective methods. The writer uses for testing the charts of Verhoeff. In using these the eye is made slightly myopic in all meridians by overcorrection with convex glasses. If the eye is already myopic care is taken not to place before the eye the full correction. The patient looks at the wheel chart (Fig. 2) and is told

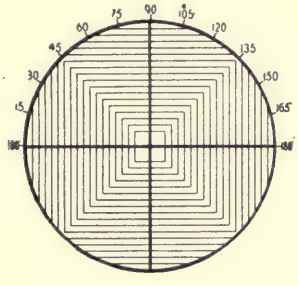


FIG. 1.

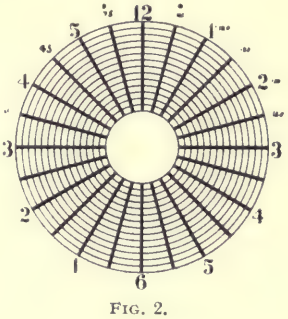


FIG. 2.

to designate the blackest diameter. This gives one the principal meridians of the dioptric system. Should the two or three adjacent lines appear black and distinct the meridian lines will point midway between them. The chart (Fig. 1) is then placed before the patient and

the card rotated so that one heavy line corresponds to the meridian determined by the former chart. After making certain that both heavy lines on the chart are blurred, concave cylinders are placed with the axes parallel to the more blurred of the two heavy lines until the patient recognizes no difference in distinctness. As a more delicate test he is asked to compare the fine lines on the chart. If these are quite indistinct the blurring is slightly reduced by substituting a weaker sphere in hyperopia or a stronger sphere in myopia. The fine lines on the chart ought to be slightly and equally blurred. If one series is more distinct than those at right angles to it cylinders are placed in the trial frame until all the fine lines are uniform. Astigmatic charts as devised by Verhoeff are preferable to the single-line charts, as the contact of the cross-lines enables one to estimate more accurately any difference in distinctness of the test lines. With these charts practically all cases of astigmatism and myopia can be as accurately determined as with cycloplegia.

Aspiration in Acute Articular Rheumatism.—

CORDEIRO, F. J. B. *American Journal of the Medical Sciences,* vol. cxxxi, No. 3, p. 529, March, 1906.

Much has been added to our knowledge of acute rheumatism in late years, and there is a growing belief that it is to be classed among the infections and that it is probably contagious. Its mortality approximates that of other infectious diseases, and there is a tendency to occur in epidemics in periods of from three to six years. The writer for some years has treated acute rheumatism as a surgical disease. As early as 1899 he reported a typical case of acute rheumatism treated by joint aspiration alone. The disease had shifted around and finally attacked the right knee-joint with particular violence. The accumulation of fluid in the joint was so great as to semiflex the leg. An effort to straighten the leg caused severe pain. The joint was aspirated, which gave a feeling of comfort. The redness of the skin disappeared, and the temperature fell from 102° to 100°. The disease shifted to other joints, but the accumulation of fluid was too small to require aspiration. The illness lasted ten days.

Since treating this case it has been the practice of the writer to withdraw fluid where there was sufficient to justify aspiration. Another case is reported of not very severe rheumatism which was treated with bicarbonate of sodium and oil of wintergreen. The duration of the attack was twenty days. Eight days after the return to work there was a relapse, the knees and wrist being involved, and the temperature was 103°. A few days later two ounces of fluid was withdrawn from the right knee, which was the joint principally affected. Immediately after the aspiration the temperature fell to normal, and in three days the patient was walking about, and on the fourth day returned to work. About three weeks later there was slight recurrence, which was treated in the usual way. There were two subsequent relapses within less than a month in which the ankle required aspiration, and the left knee in the last attack. The removal of the fluid was followed by prompt cessation of the constitutional symptoms, and the patient was able to return to work immediately.

Teaching the Deaf Child to Hear.—

HUDSON-MAKUEN, G. *New York Medical Journal,* vol. lxxxiii, No. 11, p. 540, March 17, 1906.

More than 200 years ago it was noted that so-called deaf-mutes had a perception of sounds. In some instances they could distinguish between high- and low-pitched sounds, but the aural apparatus was so defective that speech was impossible. Recently marked attention has been devoted to this class of cases in

an effort to improve the hearing by vocal gymnastics. Urbantschitsch, of Vienna, has made an extended series of investigations along these lines, and his methods have been generally adopted in Austrian schools for the deaf. Natier, of Paris, has instituted a system of aural gymnastics for adults, using a series of tuning-forks. The forks vary from a low to a high pitch, and by selecting those having the appropriate number of vibrations he aims to stimulate action in the sluggish nerves and arouse latent hearing. Urbantschitsch depends almost wholly on the speaking voice for the hearing exercises.

The writer reports the case of a girl who at five years of age was regarded as a deaf-mute. It was observed that she could hear and in some degree enjoy certain forms of instrumental music, although she gave no indication of any appreciation of speech sounds, and her only means of communication was that of pantomime. Under vocal gymnastics this patient within a year was able to speak many words distinctly. A child may have a fair degree of hearing power and yet lose it from disuse. Never having experienced the advantages of acute hearing they have no incentive to give attention to sounds that are not clearly audible to them. The child does not hear enough of the conversation about him to attract his attention, and there is no inducement to continue to listen, and hence the auditory centers do not develop. The practical application of vocal gymnastics must depend upon the individual peculiarities. Only those children having a remnant of hearing power can be regarded as suitable subjects. The determining of this hearing power often taxes the ingenuity of the physician to the utmost. Frequently musical instruments are valuable for this purpose. Children giving the slightest response to any sound should have the hearing exercises. It is not difficult to teach even totally deaf children to speak and to understand speech through the senses of touch and sight, but the voice is always harsh and disagreeable. The sense of hearing is essential to the modulation of the voice, and this is of diagnostic importance. The so-called deaf-mute who learns to speak in modulated tones has some hearing power that may be improved by exercise. Teaching the child to speak is quite as important as teaching him to hear; the one helps the other.

Treatment of Hemophilia.—

GRANT, L. *Caledonian Medical Journal,* vol. vi, No. 8, p. 321, April, 1906.

The pathology of this affection is still unknown. The disease is constitutional, characterized by a remarkably congenital tendency. Various theories have been offered to account for it. One is that there was some alteration of the capillaries with fatty degeneration of the endothelium. Others look upon it as an undue thinness of the vessel walls, or a narrowing of the lumen of the vessels, while others regard it as due to a want of coagulability in the blood. It is probable that the latter view is more nearly correct. A peculiarity in the hereditary transmission of the disease is its descent through the women to the sons, hence a prophylactic measure would be sterility on the part of women liable to transmit the disease. In the treatment of the affection general systemic tonics such as iron and cod-liver oil are useful. There are certain symptoms which precede spontaneous hemorrhages, such as flushing of the face, congestion, and swelling of the ears. In such cases rest in bed should be advised, and cathartics should be administered. Suprarenal extract is a valuable remedy frequently made use of as a local application. The thyroid has also been recommended.

The writer was impressed by the rarity of the disease in women, and was led to try ovarian extracts in its treatment. It has been used

in two cases with apparent benefit. Nosebleed in hemophiliacs is with difficulty controlled. Special care must be taken to avoid any injury to the mucous membrane by strong astringents or pressure pads. The patients should be placed in a sitting position and the nose carefully syringed with cold boric solutions. The anterior nares are then carefully packed with a strip of gauze soaked in a 1-in-1000 adrenalin solution. This is left in position for from six to eight hours. The patient is given 20 grains of chloride of calcium in solution every eight hours.

Modern Treatment of Fractures.—

BECK, C. *Medical Record,* vol. lxix, No. 12, p. 449, March 24, 1906.

The writer sums up the modern method of treating fractures with the statement that the Roentgen ray in combination with the usual methods of examination should be used to determine the character of a suspected bone injury. If the bone has not been injured the proper treatment consists in massage followed by immobilization, a movable splint being preferable for the latter purpose. If there is a fissure or fracture without displacement, manipulations of the injured part must be avoided and immobilization in the most comfortable position applied. As a rule a plaster-of-Paris dressing best answers the purpose. After two or three weeks it must be removed and massage begun. In about two weeks a splint of plaster of Paris can be applied which the patient can take off and replace. If there is any displacement reduction must be made at once. This can be done either under the control of the fluoroscope or on a translucent table. After reposition the plaster-of-Paris dressing should be applied. A more tedious but safer way is to reduce the displacement under the guidance of a skiagraph taken before. This will indicate in which direction the efforts at reduction must be made. After the plaster-of-Paris dressing has been applied, then the skiagraph should be employed to ascertain whether the reposition is complete. If the latter is not perfect the dressing must be removed and another attempt made. If the reduction meets with difficulty, an occurrence which can as a rule be anticipated from the nature of the skiagraph, anesthesia should be employed. In those cases with entangling of the fragments, extensive splintering, or similar complications, reposition even under anesthesia cannot be accomplished. Then the fragments must be exposed and brought into apposition. If there is a tendency to displacement after the dressing is applied it is safer to expose the fragments and unite them with catgut, providing enough periosteum is found, otherwise they should be kept together with a wire suture.

Alcohol in Carbolic Acid Poisoning.—

CLARKE, T. W., and BROWN, E. D. *Journal of the American Medical Association,* vol. xlvi, No. 11, p. 782, March 17, 1906.

Thirteen cases of carbolic acid poisoning treated by lavage with diluted alcohol are reported, and a comparison is made with cases treated with alcohol. The slight difference in the mortality of the two series and the greater constitutional disturbance observed when the acid was taken with alcohol raised doubts of the antidotal power of alcohol. Experiments were performed to test the systematic antagonism of alcohol and phenol, and to test the antagonism in the stomach and efficiency of lavage. The conclusions reached were that alcohol has a local antidotal effect on carbolic burns due to its solvent action, but there is no evidence of chemical antagonism between alcohol and phenol. There is no effect produced by alcohol on carbolic acid poisoning after the latter has been absorbed into the system. Alcohol and phenol placed in the stomach give no different

results from phenol alone. Lavage with alcohol is effective when the phenol is in the stomach, but its superiority over lavage with water is not pronounced. There is a possible antagonism between alcohol and phenol, but its solvent action may under certain conditions be a danger rather than advantage. Cases have occurred in which carbolic acid has been taken in whisky, and this contraindicates the practice of leaving the alcohol and the carbolic acid in the stomach. The treatment recommended for carbolic acid poisoning is immediate and abundant lavage with 10-per-cent alcohol. This to be followed by lavage with plain water and the administration of stimulants as needed. To be effective the alcohol must be used while the acid is in the stomach. The danger of pneumonia from inhalation of the regurgitated stomach contents during lavage in an unconscious subject is pointed out. It is advised that the patient's head should be turned to one side, and the head should be kept low so that anything entering the pharynx will flow out through the mouth.

Exophthalmic Goitre Treated by the Roentgen Ray.—

PFAHLER, G. E., and THRUSH, M. C. *Therapeutic Gazette,* vol. xxii, No. 3, p. 179, March 15, 1906.

The illness began May 30, 1905, with a swelling on the left side of the neck, which reached its maximum four days later, after which it remained stationary. While the tumor was growing there was a dull pain. Several months preceding the development of the growth the patient had been restless and nervous. There were twitchings of the muscles of the lower extremities and a sense of oppression in the chest. There was distinct exophthalmos. The *x*-ray treatment was begun July 26. The pulse was 120, and the patient was restless and had a haggard, careworn appearance. At the end of a month there was a distinct improvement, with a reduction in the size of the enlarged gland. Four months after beginning treatment her health was fully restored, the pulse was 72, and there was a gain of 25 pounds in weight. In all twenty-two treatments were used. During the treatment the patient was given wine of iodine, valerian, asafetida, strophanthus, digitalis, and belladonna, combined with iron and arsenic. Among those who have reported improvement in cases of goitre with the *x*-ray are William Blacklock, Spring, Görl, Stegmann. In all thirty-one cases were treated, of whom four were of the exophthalmic type. Pusey's experience in the treatment of this disease with the *x*-ray has not been favorable.

The Treatment of Mixed Infection in Tuberculosis.—

POTTENGER, F. M., and BROWNING, C. C. *Journal of the American Medical Association,* vol. xlvi, No. 12, p. 863, March 24, 1906.

The writers have employed streptolytic serum in a number of cases of tuberculosis in which streptococci were found in the sputum. The serum was used subcutaneously, beginning with 20 cubic centimeters, and following with 10 cubic centimeters each day. Their observations teach that the streptococci are found in lung tissue beyond the areas of necrosis and can be present without causing acute symptoms. The products of the tubercle bacillus cause symptoms closely resembling if not identical with those of the so-called mixed infections. It is possible that these symptoms are due sometimes to one or the other, and possibly to both combined. The streptococcus plays a part at least in some of the cases of mixed infection, and streptolytic serum has some specific action on the streptococcus, as shown by the reduction of fever and abatement of symptoms in some cases of the hectic type. The streptococcus plays a part in the general pathology of the tuberculous process. In chronic cases without marked symptoms this is shown by the altered character of the sputum and the

general improvement following the use of the serum in nearly all cases. When no acute symptoms are present the serum seems to exert a favorable influence on the course of the disease often enough to suggest that the presence of the streptococcus affects the tuberculous process unfavorably, even in cases in which no active symptoms are present. Mixed infection is a factor to be recognized and dealt with before the advent of threatening symptoms, just as tuberculosis is to be diagnosed and treated before the advent of consumption.

Local Anesthesia for Minor Operations.—

STAMM, L. E. *Lancet,* vol. clxx, No. 11 of vol. i, p. 754, March 17, 1906.

The writer expresses the belief that the real sphere of local anesthesia is in the operations of minor surgery. By these he understands skin-deep incisions which are made for the removal of sebaceous cysts, lipomata, fibromata, and other cutaneous or subcutaneous excrescences. In limited operations a stronger solution of the local anesthetic can be employed, as the amount which is necessary to inject is less than will cause systemic toxic symptoms. As strong a solution as four per cent of eucaine can be employed, to which should be added a small quantity of active adrenalin solution. It should be remembered that adrenalin is subject to rapid oxidation, and it then loses its efficiency. This difficulty has been overcome by Parke, Davis & Co., who have prepared a one-per-cent solution of eucaine to which active adrenalin has been added, the product being placed on the market under the trade name of eudrenin. With this preparation most satisfactory results are obtained. The skin having been thoroughly cleansed, a few minims of eudrenin solution is injected with an ordinary hypodermic syringe, previously sterilized, in two or three places along the intended incision, care being taken to inject the solution in the course of the nerves which supply the part. Fifteen to twenty minutes should be allowed for the analgesic to have its full effect. In these minor operations a collodion dressing can usually be applied, and the patient can immediately go about his ordinary avocations.

A New Method for the Production of Ultraviolet Rays.—

BOWIE, J. C. *Lancet,* vol. clxx, No. 9 of vol. i, p. 587, March 3, 1906.

The writer claims to have solved the difficult problem of producing an abundance of ultraviolet rays at a minimum of expense. It is these rays that have proved so efficacious in the treatment of lupus and certain skin affections. Finsen in his earlier experimental work used sunlight, which contains a large proportion of heat rays which are difficult to get rid of and a comparatively small quantity of ultraviolet rays. To conserve these it was necessary to use rock crystal compressors and a prolonged application. In the years following Finsen's earlier work numerous efforts have been made to improve upon the apparatus, simplify its construction, and add to its effectiveness. Practically none of the modified lamps are as efficient as the Finsen light, but the installation is expensive and the amount of current used is enormous. Bowie points out that the difficulty in the application of the ultraviolet rays is the impossibility of liberating them in glass tubes or lamps and in freeing them from the infra-red or heat rays. He claims to have overcome these difficulties by the use of low-tension high-frequency currents. It is claimed that low-tension currents admit of a large quantity being used with safety. He claims to have constructed a machine which will deliver 10 amperes at 80 volts with a periodicity of 360 million per second. It was not only possible to place himself in circuit with such a current, but 6 to 7 amperes could be passed through the body without any disagreeable sensation. He

has found that with a current of this periodicity the violet rays produced were of great volume and purity, and practically the whole of the current could be converted into rays.

Balsam of Peru in Castor Oil as a Surgical Dressing.—

HUBBARD, E. V. *New York Medical Journal,* vol. lxxxiii, No. 10, p. 505, March 10, 1906.

The value of this dressing was first pointed out by W. W. Van Arsdale in 1893. Some writers say that balsam of Peru has no antiseptic action, but this is denied by others, who claim that it has a feeble power of inhibiting the growth of germs. Van Arsdale pointed out the uselessness of gauze drains as usually employed—in fact they often act as a cork, preventing the evacuation of pus. Even a rubber tube will often clog and act as a stopper. It was for the purpose of oiling the dressing and giving permanent exit to the pus that Van Arsdale devised the mixture of balsam of Peru one-half drachm and castor oil one ounce. The castor oil can be sterilized before adding the balsam. This combination forms a permanent mixture, moderately antiseptic, always viscous, and furnishes a dressing that will not harden and will take up wound discharges as fast as they are formed.

Poisoning by Rhus Toxicodendron and Rhus Radicans.—

MCKEE, E. S. *Pacific Medical Journal,* vol. xlix, No. 3, p. 129, March, 1906.

The writer describes a severe case of rhus poisoning of which he was the victim. The eruption appeared the following morning after the exposure, and on the second morning the swelling of the face was so great that the eyes were closed. All over the body were small blisters, the burning and itching being intolerable for a week. Weak phenol solutions and salves gave temporary relief, as did solutions of borax. Lead water and opium gave some relief. Powdering the whole body with rice powder was followed by a feeling of comfort lasting five or six hours. A heavy lather of soap gave partial relief. The most complete relief was obtained from a prescription containing approximately equal parts of alcohol and distilled water, to which all the acetate of lead was added that the fluid would dissolve. The poisonous properties of rhus are due to a soluble fat, and where the fat can be removed by alcohol it should be done. After the vesicles have appeared and the skin is greatly irritated, then the application of the diluted alcohol and lead should be made.

Lead Poisoning Caused by Lead Acetate in Therapeutic Doses.—

PEPPER, W. *American Medicine,* vol. xi, No. 13, p. 472, March 31, 1906.

A case is described of a man who was admitted to the hospital for a chronic diarrhea. It was noted that he had a blue line on the gums, and he was given treatment appropriate for lead poisoning. It seems that he had been a sufferer from chronic diarrhea, and during the summer before his admission he had been given a bottle containing lead acetate, a dose of which contained one grain. This had been taken in teaspoonful doses at intervals during the summer. As near as could be estimated from 2 to 2½ drachms of acetate of lead was consumed in a period of five or six weeks.

Treatment of Tuberculous Pleurisy.—

MARTIN, S. *Lancet,* vol. clxx, No. 9 of vol. i, p. 586, March 3, 1906.

Beyond the ordinary measures of rest in bed and good nursing the main point is the question of removing the fluid from the chest. There appears to be no greater danger in removing the fluid in tuberculous cases than in the non-tuberculous, and there may be good reasons for the removal of fluid, as in this way permanent adhesions may be prevented. Apart from any urgency, such as embarrassment of

respiration, it is not wise to allow any quantity of fluid to remain in the chest for a long time. Cases which run a prolonged course with elevated temperature, but with no symptoms, are best treated in the open air with rest and forced feeding. After the temperature has fallen these patients require a long course of such treatment.

THERAPEUTIC BREVITIES.

Adrenalin in Cases of Failure of Circulation.—

P. Lockhart Mummery, in a letter to the *Lancet* of March 17, 1906, comments on a case reported by H. O. Butler in which adrenalin was administered to overcome severe vasomotor exhaustion in the crisis of pneumonia. He says adrenalin is a powerful drug and of great value if properly used. It should not be spoken of as a vasomotor stimulant, as it acts directly on the vessel walls and not through the nerve centers. It is this action which makes it of such value in vasomotor exhaustion. It constricts the peripheral vessels and raises the blood-pressure. This action has nothing to do with the nervous system, and the effect is produced in an animal whose nervous system has been destroyed. His criticism on Dr. Butler's case was that the dose of adrenalin was too large, though it undoubtedly saved the child's life. The fifteen minims injected probably caused excessive blood-pressure, with which the heart, already weakened, was temporarily unable to cope. An injection of one or two minims or even less would have been enough to raise the blood-pressure to the necessary height. Adrenalin in minute doses introduced into the peripheral circulation will raise the blood-pressure above the normal level. In cases of failing circulation with a very low blood-pressure adrenalin injected under the skin has a poor chance of reaching the peripheral blood-vessels, and in such cases it must be administered by intravenous infusion. When given intravenously it should never be used in a stronger solution than 1 in 20,000. The drug besides acting on the peripheral blood-vesels causes contraction of the cardiac muscle, which may pass into a condition of rigor. Adrenalin should be given in small doses and repeated frequently, as its effects are transitory. Used in this way it is a drug of great value and will frequently save life.

Ice-bags.—

P. H. Aurness (*Journal of the American Medical Association,* March 24, 1906) says that the ice-bag is especially valuable in acute inflammations due to bacterial invasion. To be efficient there should be constant drainage from the bag in order to keep the temperature that of melting ice. The writer describes an ice-bag in which drainage is properly provided for, and which is suitable for pneumonia cases. It is claimed that ice-bags are especially useful in acute meningitis, acute mastoid disease, tonsillitis, lobar pneumonia, acute pleurisy, acute endocarditis, gastritis, arthritis, synovitis, and appendicitis.

MEDICINE.

Chronic Rigidity of the Spine.—

WARRINGTON, W. B. *Medical Chronicle,* vol. x, No. 6, p. 343, March, 1906.

Rigidity and deformity of the spine results from many quite different morbid processes. That form of joint disease known as arthritis deformans when it affects the spine makes it rigid and immobile, due to the formation of bony buttresses and ankylosis. The antiquity of the disease is attested by finding a well marked example in an Egyptian mummy.

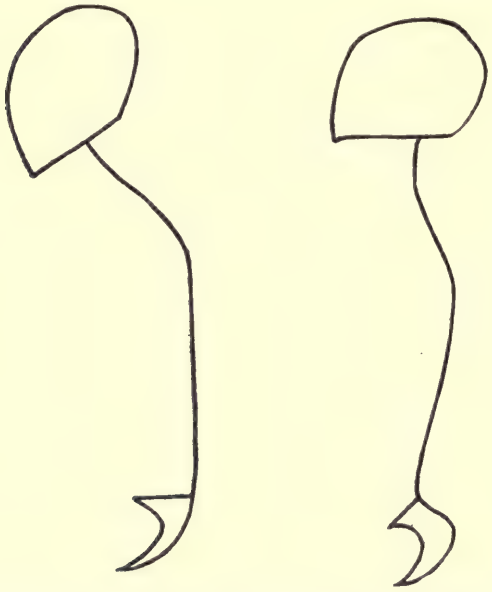
Bechterew claims to have discovered a special form of disease of the spine characterized by immobility or greatly diminished move-

ments of the whole or part of the vertebral column, but without pain on percussion over the spines; angular curvature in the upper dorsal region and displacement of the head downward and forward; paresis and some atrophy of the muscles of the trunk and limb girdles; irritation of the spinal nerve roots, giving rise to violent pains in the back, neck, and extremities; and by an anesthetic area in the region of supply of the upper dorsal nerves. The disease occurred in family groups in some instances and was usually progressive. Bechterew believed that there was primary involvement of the meninges leading to degeneration of the roots, and then to paresis of the muscles of the thorax and the back, and to a less extent of those of the extremities. The muscular atrophy caused the kyphosis, and this in turn increased the pressure on the intravertebral cartilages, which finally became atrophied so that the vertebral bodies were in direct contact with one another and ultimately fused. Marie described under the term spondylose rhizomyelique a disease in which the spine is ankylosed, with associated involvement of the articulation of the limb girdles, the small articulations remaining intact. The spine is affected in a peculiar manner, the lower part being straightened, while the upper and dorsal part is bent forward, the face looking in front and downward. The thighs are in flexion, so that the knees must be kept bent. The thorax is flattened from before backward, the breathing being abdominal. Root pains are absent, and there are no signs of redness or swelling about the vertebral column, and no fever. In Marie's cases the patients were not subject to rheumatism.

The cases reported by the writer approximate these two types, but without having their precise features. A sailor 49 years of age received a slight fall six months before admission to the hospital. The accident was looked upon as trivial, but soon afterward he experienced a dull pain at the back of the neck, and at the end of three days was unable to move his head. There was a description of pains in the lower part of the back. The patient's neck projected forward, the head being flexed nearly 30 degrees below the horizontal. The lower part of the spine was rigid and straight in the vertical axis, so that to maintain the upright position the knees were slightly flexed. The whole spine was rigid, the trunk and pelvis moving together. The anterior surface of the thorax was flattened, its normal convex curvature being lost. Respiration was abdominal. The remaining joints were intact. There was no limitation in the movements of the hip- or shoulder-joints. The sensory symptoms were slight. Beyond a dull aching pain at the back of the head there was no spontaneous pain. Firm pressure over the cervical region was painful, and curious paresthesia, numbness, and tingling prevailed in the extremities. There was no anesthesia. The posterior borders of the scapulæ projected abnormally, and the supra- and infraspinatus muscles were flabby. There was atrophy in the first dorsal interosseus muscles and in the thenar and hypothenar eminences. The deep reflexes were brisk. Skiagraphic examination of the bones showed no alteration. A sister of this patient on examination was found to have an immovable head which was fixed at right angles to the vertebral column. The whole spine was rigid. Stooping without bending the knees was impossible. The upper portion of the spine was straight. The movements of the hip-joints were slightly limited and in the shoulder-joints coarse crackling could be felt. This condition had existed for twelve years, and the general health was excellent.

Another patient had been well until four years before coming under observation, when he experienced pains in the lower part of the thorax, which were aggravated by movement.

The pains persisted for two years before the stiffness in the back and neck became marked, though he had early experienced some difficulty in rising from the sitting position. Swelling in the knees, ankles, and shoulders came on eight months before he was seen, and it was soon followed by involvement of the small joints of the hand. The patient was a poorly nourished, anemic man. There was slight tumefaction of the second and third phalangeal joints of both hands, but the wrists, maxillary and clavicular joints were normal. The hip-



Outline on the left exhibits the curves of the spinal column usually assumed in chronic rigidity; that on the right the curves of the normal spine.

joints were free, and the thighs could be freely moved in all directions without pain. There was slight grating but no swelling in the knee-joints, and a similar condition in the shoulders. The humerus could not be raised without causing pain. There was atrophy of the shoulder girdle muscles. The knee- and ankle-jerks were exaggerated. No abnormality could be detected in the axilla, though the pulse-rate was too frequent. Pain was absent except on attempting to bend the vertebral column. The normal lumbar curve was straight as far as the seventh dorsal vertebra, when the spine bent forward sharply so that the head was advanced in front of the body. When placed on his back the upper part of the body remained above the horizontal, and this attitude was accompanied by much pain. When placed in the prone position the body rested upon the knees and head. The pelvis was tilted forward, showing the obliteration of the normal lumbar curve (see diagram). The thorax was immobile even on attempting forced respiration, and it was flattened from before backward. In this case the joints of the extremities were evidently crippled by synovial changes, and it is probable that the same process invades the synovial joints of the spine.

A stoker aged 34 first consulted for stiffness in the lower part of the back and weakness in the legs. The trouble began two months before, and there was no history of previous joint affection, nervous or venereal disease. There was marked kyphosis of the upper dorsal spine, while the lumbar curvature was obliterated. When in the horizontal position the thighs remained at an angle of about 30 degrees, and on reducing this displacement a lumbar lordosis was produced. All other joints were free. The head could be freely moved, but any attempt to bend it back caused severe pain in the back and in the legs. There was no disturbance of sensation and no atrophy of muscles. Both knee- and ankle-jerks were brisk, without clonus. The plantar response was persistently of an extensor type. The patient remained in the hospital for three months, and was treated by daily hot douches to the spine, local inunctions of mercury, and iodide of potassium and guaiacum resin administered internally. There was a gradual, continuous improvement, so that the rigidity and faulty position of the trunk almost disappeared, but the exaggeration of the deep reflexes and

the presence of the extensor toe response persisted.

In discussing these cases the writer says that spinal rigidity presents a clinical picture agreeing in some particulars but contrasting sharply in others. It is not desirable to consider the condition as a special disease. Nervous symptoms may be obtrusive, but excluding the rare occasions in which the spinal column is affected in tabes and syringomyelia, and with the possible exception of Bechterew's type, these appear to be due to secondary invasion. The prognosis is variable, since the site and nature of the process causing the rigidity are not the same. In treatment the best results are obtained by hydropathic measures and massage in conjunction with constitutional remedies.

On the Artificial Cultivation of an Invisible Microorganism from Vaccine Virus.—

PROESCHER. *Centr. f. Bakt.,* vol. xl, No. 3, p. 337, Jan. 15, 1906.

Not a single one of the many investigators who have busied themselves in endeavors to cultivate specific microörganisms from vaccine virus has been successful, which is to be explained by the fact that although the growth of the virus probably takes place in the test-tubes its isolation from the accompanying bacteria has not been accomplished. When perfectly sterile lymph is used for culture purposes the culture medium appears sterile, and no microorganisms can be demonstrated by either macroscopic or microscopic examination. The demonstration that the virus itself has multiplied can be brought about only by biological means—that is to say, by a transplantation of the invisible culture, but this is possible only so long as the virulence of the culture is retained. It is therefore possible to produce pustules in the calf with this apparently invisible material. The experiments up to the present time show that the virus loses its virulence after having been transplanted three or four times, and so soon as the virulence is lost the virus withdraws itself from our observation. This does not, however, prove that the power of multiplication on the part of this virus has come to an end. It has always been previously supposed that the vaccine contagion is dead so soon as its transplantation ceases to be followed by pustulation; but this is a mistake, and Proescher has found that in spite of the loss of its virulence the virus remains living for a long time. In this he sees a correspondence between the vaccine microörganism and other well known pathogenic organisms—meningococci, streptococci, etc.—which when transplanted to artificial media soon lose their virulence, though their power of multiplication remains.

In order that a sensible and recognizable growth of the vaccine virus upon the utilized culture medium shall take place some medium must be used in which the invisible growth shall be made recognizable by some specific change brought about. After an unending series of almost insurmountable difficulties Proescher was finally able to prepare both fluid and liquid culture media in which the multiplication of the vaccine contagion could be demonstrated. By the aid of this medium he has been able to cultivate one and the same microörganism from a number of different varieties of vaccine lymph obtained from six different laboratories.

The culture develops best at 37° C. The liquid medium becomes homogeneously clouded. The growth of the culture upon the solid medium is more typical, as a macroscopically demonstrable, somewhat peculiar, gray-white layer is formed upon the surface. Upon microscopic examination this is found to consist of amorphous masses and in part of very fine aggregations of crystals. This layer forms the visible expression of the vitality of

the vaccine virus. Proescher believes the virus itself to be invisible, and regards the surface layer upon the culture medium as a mass of transformation products of the medium resulting from the microörganismal growth. This peculiarity is specific, and is occasioned by no other known microörganism. It must be mentioned that this invisible contagion continues to grow visibly upon culture media containing as much as 20 per cent of glycerin, and when it is transferred to a calf it is still able to produce very slight pustulation. Inoculated upon the rabbit's cornea or upon the cornea of guinea-pigs the well known vaccine keratitis develops, and in the corneal tissue the bodies of Guarnieri may be found. Proescher believes this to be the final demonstration of the fact that these bodies are not protozoa, but cell-degeneration products made under the influence of the vaccine virus.

The virulence of the vaccine disappears, as has already been said, upon artificial culture media, even though kept at 37°, in several days. Sometimes the virulence is lost after the second transplantation, or the virulence of the virus no longer retains its vegetative power, though Proescher was not able to secure permanent cultures. Passage through the calf did not bring back the lost virulence. The introduction of the cultures into the circulating blood of rabbits caused the appearance of large numbers of Mastzellen.

It is too early to say whether the introduction of this virulent virus is capable of producing immunity or not. Later communications will contain information regarding agglutinins, precipitins, antitoxins, and other immunity products in their relation to the microörganism.

In the present contribution Proescher does not give the composition of the culture medium upon which the ocular demonstration of the presence of the invisible virus can be made, but a foot-note to his article says that it will be made the subject of a later communication.

"Double Ego."—

GORDON, E. *American Journal of the Medical Sciences,* vol. cxxxi, No. 3, p. 480, March, 1906.

Disturbances of consciousness manifest themselves in various degrees. The most typical form is amnesia. The person thus affected loses all remembrance of his previous life. He possesses a new ego. He passes through two or more different periods of life as two or more personalities, and one is not aware of the existence of the other. In a certain group fragments of one personality are retained by the other, and these lead into cases in which there is no real complete interruption, but only an altered power of criticism at various periods.

In the majority of cases of dual personality, each personality in its own state acts in response to inner stimulation, and one state has not the remotest association with the other. All the cases of double or multiple consciousness recorded in the literature present almost the same feature. At no time was there a simultaneous coexistence of the two egos. One follows the other, or they alternate.

The case reported occurred in a lad 19 years of age, who was accused by his mother of staying away from home two nights. He was employed to sell tickets in a theater, and during the two nights he was at the ticket office as usual. He had no recollection of being absent from his home, and was surprised when he was told of it. He was also astonished when his employer told him that certain new orders given at that time were not carried out by him. Since then the same disobedience was noticed several times, and the employer wondered why he should accept the order and then ignore it. His work had always been exact. He was able to do the routine work without the slightest mistake, but when told to do an act outside of the ordinary routine he was unable to attend to it. Attacks of this absent-mindedness, as it was called, would occur

quite frequently. At first he disbelieved in the occurrences, but finally accepted them, and gradually began to recall some facts which happened during these attacks when persistently reminded of them. They would appear to him as having occurred long ago and at a great distance from him. Being constantly reminded of this condition, he gradually recalled more and more of the things that were done in this state, so that he began after a time to recognize the second state and to expect its recurrence. About eighteen months after the onset he was conscious of an internal conversation. This "being" always opposed his actions and tried to interfere with him and suggest wrong-doing. At first he would feel the other being rarely, but later quite frequently. He tried to overcome this internal opposition, but the more he tried the less he succeeded. The constant struggle brought him gradually face to face with the second personality. At first the latter would appear only in spells, but gradually it became continuous. Whatever No. 1 wishes to do No. 2 will always take the opposite view and will interfere with the action of No. 1, so there is a struggle for supremacy between the two egos. Ordinarily No. 1 succeeds in overcoming No. 2, but sometimes the fight is so hard that No. 1 succumbs and No. 2 takes full possession of No. 1. On one occasion the patient suffered from toothache. A dentist applied to the tooth some medicine. When he arrived home No. 2 said, "I have got you now." A fight ensued. No. 1 lost the battle, and then the patient lost consciousness. The fight between the two egos is continuous. Nine weeks ago they compromised. No. 1 promised to teach No. 2 his business. In return No. 1 will have the right to smoke and continue his work without being interfered with. As soon as No. 2 learned the business he broke the promise, refused to give No. 1 his liberty, and the conditions remained the same, namely, full possession is taken of No. 1 by No. 2 occasionally. Only recently he stayed away from his home nine consecutive nights, fully recognizing the gravity of the deed, but was unable to overcome No. 2, who had full possession of him.

In addition to the spell above described he has had other attacks of loss of consciousness, and sometimes would have attacks in which he would seem to forget what he was doing. He is fully conscious of the double ego, the personality known as No. 2 always impelling him to do evil acts, and when No. 2 overcomes No. 1 there is generally unconsciousness. The patient is intelligent, industrious, has a responsible occupation, and attends to it carefully. There are no hysterical stigmata. There is marked tremor of the hands and the pupils are slightly unequal. A disturbance of consciousness is the fundamental feature. It is probable that the disturbance is an expression of an underlying epileptoid condition.

Prostatic Albuminuria.—

BALLENGER, E. G. *New York Medical Journal,* vol. lxxxiii, No. 8, p. 399, Feb. 24, 1906.

Albuminous secretion from inflamed prostatic glands furnishes many of the cases of apparently harmless albuminuria. After massage of the prostatic gland a considerable amount of proteid is found in the discharge. Such secretions when excessive are more likely to pass into the bladder than to appear at the meatus. Urine which contains these secretions may be quite clear, and any of the ordinary forms of proteid commonly present in the urine may be found. The nucleoalbumin is probably derived from the disintegration of cells lining the prostatic ducts and follicles, while the serum-albumin probably exudes from inflamed or desquamated surfaces. This is a possible source of albumin in the postural or ortho-

static albuminuria. Exertion would express the albuminous secretions of the prostate, and they would commonly be more abundant in the latter part of the day. Additional probability is lent to this explanation, as it has been shown that cyclical albuminuria is most common in males. The albumin in these is small in quantity and intermittent, corresponding with periodic variations in secretions from the prostate.

Onset of Hemiplegia in Vascular Lesions.—

JONES, A. E. *Brain,* parts cxi and cxii, p. 527, Autumn and Winter, 1905.

The diagnosis of vascular lesions associated with hemiplegia is very difficult, and the data upon which an opinion can be given are still very uncertain. It is pointed out that accurate data can be arrived at only by the study of a large series of cases in which the symptoms have been accurately noted and in which post-mortem examinations have been made. Such a series of cases is furnished by the University College Hospital post-mortem records. With these at hand the writer has been able to formulate some conclusions which he regards as tentative. His results confirm the old view that rest in bed, and especially sleep, protect to some extent against cerebral hemorrhage. This is a more accurate statement than that rest and sleep predispose to thrombosis, as there is no evidence in favor of this. In practice the two statements have a similar bearing on diagnosis. Severe exertion and time of day appear to have had too much stress laid on them in the past. A miliary aneurism that is going to rupture rarely needs the aid of severe exertion. Consciousness is lost at the onset in half the cases of occluding lesions and in three-quarters of hemorrhagic lesions. It is transitorily affected in many of the remaining cases. Too much importance should not be attached to this as a diagnostic guide, as there is an important group of occluding lesions in which the onset is apoplectiform and another group of hemorrhage lesions in which the onset is insidious. The immediate prognosis is grave when the onset is apoplectiform, especially so in cases of hemorrhage. Cases of late hemiplegia due to hemorrhage are less likely to suffer from loss of consciousness at the onset than hemorrhagic cases taken as a whole, and are therefore not likely to be attributed to thrombosis. Intraventricular hemorrhage, which is nearly always secondary, may not cause loss of consciousness. Immediate loss of consciousness may be an initial symptom in extraventricular hemorrhage. The immediate prognosis is much graver in cases of hemorrhage than in cases of occluding lesions. Most cases that survive two years are cases of thrombosis. Of the cases in which blood is found in the ventricles 60 per cent die in the first twenty-four hours and 90 per cent in the first week. It is not very rare for such cases to live a few weeks. Hemorrhage does not affect the right side of the brain more than the left, nor occluding lesions the left side more than the right.

Etiology of Eczema.—

MCGUIRE, J. C. *Medical Record,* vol. lxix, No. 8, p. 298, Feb. 24, 1906.

Gout, rheumatism, and other diseases often referred to as causes of eczema have no influence in establishing the disease. They may operate to perpetuate it by lowering the vitality of the patient and lessening the resistance of the skin. Many people are born with vulnerable skins, which later develop the disease under favorable circumstances. There is an increasing tendency to regard the disease as parasitic in origin, though it is not contagious. Many individuals are especially susceptible to inflammation of the skin. Want of cleanliness alone will not cause any form of inflammation

B. J. C.

of a normal skin. Water should not be applied to an eczematous skin affection during its acute stage. It is probable that in the future the term eczema will be limited to those cases in which a specific parasite acts upon a vulnerable skin.

Fever in Tertiary Syphilis.—

CARPENTER, N. *Medical Record,* vol. lxix, No. 11, p. 412, March 17, 1906.

The difficulty in diagnosing the fever of tertiary syphilis is illustrated by the history of two cases recently observed. The first patient was a man 24 years old, who was admitted to the hospital with remittent fever said to have been contracted at Panama. He was treated with quinine and arsenic. The plasmodium was not found; the quinine was stopped, and Fowler's solution and iron was given. Night sweats and chills were occasionally noted. The tubercle bacillus was searched for, with negative results. Syphilis was denied, but was later admitted after a slight swelling appeared above the sternal notch. Specific treatment was instituted, and an exploratory incision was made, revealing a pocket of thin, brown pus at the sternal attachment of the sternomastoid muscle. In a few weeks a small ulcer appeared on the soft palate. Under the mixed treatment it was noted that whenever the dose of mercury was moderately increased the lesions became worse. Both of these patients improved more rapidly when potassium iodide was used alone.

The Clinical History of Myasthenia Gravis.—

BUZZARD, E. F. *Brain,* parts cxi and cxii, p. 438, Autumn and Winter, 1905.

The writer has studied five cases which came to post-mortem examination. He comes to the conclusion that this disease is not always confined to the motor system, but may be associated with sensory changes, mental disturbance, or other symptoms. It has a definite and quite constant morbid anatomy. There are widely distributed cellular and sometimes serous exudates. Slight muscular fiber changes are frequent, and severe muscular atrophy is a rare occurrence. Proliferative and degenerative changes in the thymus glands are frequently but not constantly met with. The symptoms of the disease are best explained by assuming the presence of some toxic, possibly autotoxic, agent which has a special influence on the protoplasmic constituent of voluntary muscle, and a less specialized influence on the function of other tissues. The relation of this toxin to the incidence of lymph hemorrhages and to thymic alterations is not clear.

Ocular Movements Similar to Those Found Normally in the Ungulates.—

PHILLIPS, W. L. *American Medicine,* vol. xi, No. 12, p. 428, March 24, 1906.

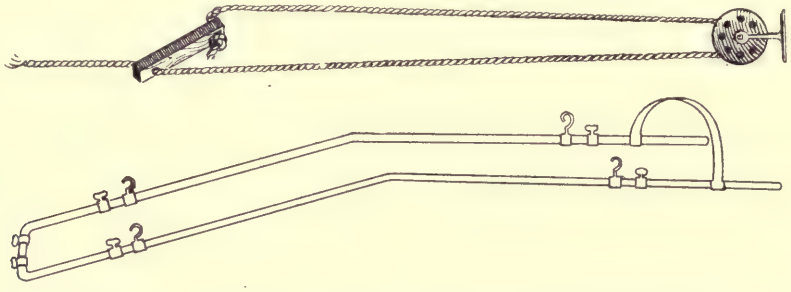
A case is described in which ocular functions existing normally in some of the lower animals were found in man. In this case each eye can be used separately, and vision is of normal acuity. It is possible for this individual to fix with both eyes, to turn either one out slowly and back again to double fixation without disturbance while reading. He is able to converge both eyes simultaneously, and also carry them to extreme diversion. Besides this he can move them both to the extreme right or left. When holding one in any position from extreme divergence to extreme convergence he can look at the side of his nose with the other. At no time since birth did he have double vision, and it is not produced even by the use of strong prisms. He finds that monocular vision is more restful than binocular vision because of less head rotation. In each of these positions he has both eyes in focus, seeing with the one in front and the other at the side.

SURGERY.

Fractures of the Femur.—

ALLEN, H. E. *Northwest Medicine,* vol. iv, No. 3, p. 73, March, 1906.

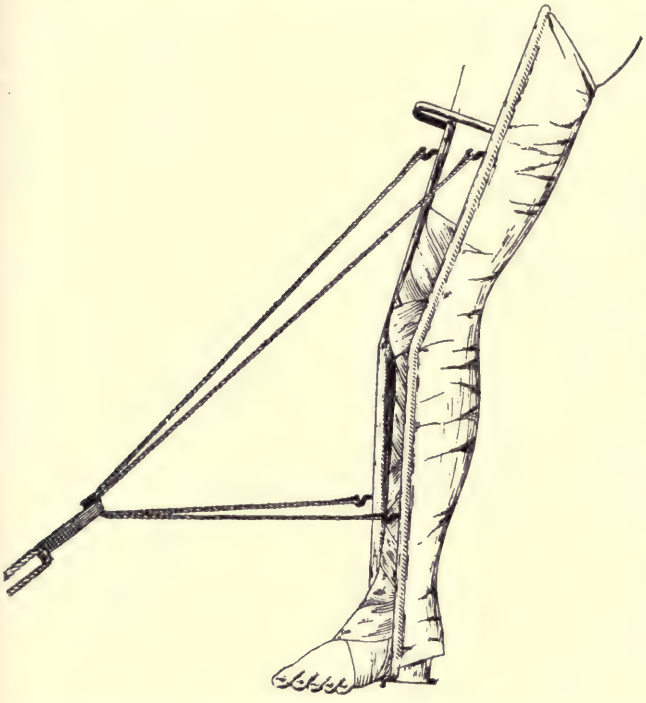
The writer claims that the adjustable Hodgen's splint is the best apparatus for treating fractures of the femur. The first cost of the apparatus is about $4, providing it is made of tubing with thumb-screws and a foot-piece. Such a splint can be used indefinitely, as it is adjustable for different cases. A simple form of the splint may be made by bending No. 2 wire and adding the sliding hooks and suspension tackle. In the application of the splint



the ordinary Buck extension is applied. This consists of adhesive plaster four inches wide and long enough to extend to a wooden block two inches beyond the sole of the foot. This block is fastened to the foot-bar of the splint. After the application of the plaster the leg is raised by an assistant, the knee slightly flexed, and steady extension made. The splint is held so that the inner arm is just above the pubes and the outer arm at the crest of the ilium. Three or four straps of muslin bandage are passed across the leg from one bar to the other and secured with safety-pins, one above the ankle, one under the knee, and one or two under the thigh. The suspension cord is then shortened by means of the sliding block, and the leg is suspended so that the heel is two or three inches from the bed. The extending force is the weight of the leg on the oblique suspension cord; the counter-extending force is the weight of the body. The amount of traction will depend on the weight of the leg and the degree of obliquity. The pulley should be at least ten feet above the bed. Under such circumstances the patient may move about and even sit up without appreciable change in the extending force or in the position of the fragments. No irritating perineal band is necessary for counter-extension as the weight of the body gives the necessary counter-force. A tendency to slide down in the bed is easily corrected by raising the foot of the bed on blocks. It is rarely necessary to resort to special force in reducing a fracture excepting when it is transverse; the ordinary oblique fracture will adjust itself in a few hours, aided by the steady equable force and the free swing of the leg. In this way an anesthetic and manipulation are avoided. By shortening or lengthening the muslin strips the angle at the knee can be altered. In fractures of the upper third of the shaft of the femur there is a tendency to bowing outward of the fragments. This angular deformity is easily corrected in this treatment by so placing the bed that the suspended leg is abducted.

The advantages claimed for the Hodgen's splint are a quite free movement allowed to the patient with a corresponding simplification of the nursing. Bed-sores and other complications due to confinement in a fixed position for a long period are easily prevented. The splint is especially useful in aged persons. A very great advantage is that the thigh is always open to inspection, and if for any rea-

son a displacement occurs it can be corrected. Measurements can be made to test the efficiency of the extension. Nutrition is less disturbed than when a more fixed dressing is employed. The amount of traction required is less than in dressings that apply extension without suspension, which lessens materially the bad



effects of a long pull on the knee-joint. As a rule there is a tendency to keep up the extension too long. The writer has reduced this period to five weeks, and he thinks it can be reduced to four. In cases in which there is good position and activity in repair four weeks will commonly secure sufficient union to prevent shortening after removing the extension.

The Blood-clot Dressing in Mastoidectomy.—

REIK, H. O. *Journal of the American Medical Association,* vol. xlvi, No. 13, 1906.

The blood-clot dressing recommended by Blake best meets the indications in mastoid operations. Those who have tried it report no unpleasant results, and it more nearly restores the natural conditions than other methods. If the wound is not thoroughly aseptic normal blood possesses a certain bactericidal power which can be relied on. This antiseptic power of the blood is only present when it is alkaline, and some of the failures of the blood-clot dressing may be due to the use of chemical antiseptics. In the operation it is best to rely on dry cleansing with sterile sponging or washing out the wound with sterile salt solution. In using the blood-clot dressing absolute cleanliness must be insisted upon, and the wound must be closed in such a way as to prevent infection. Chemical sterilization is to be avoided. In closing the wound the subcutaneous silver wire recommended by Halstead is the best. A silver-foil dressing over the closed wound adds to the protection.

Amputation of the Breast for Cancer.—

WEIR, R. F. *New York Medical Journal,* vol. lxxxiii, No. 9, p. 430, March 3, 1906.

Progressive improvement has been noted in the recurrence rate after removal of the breast for cancer after each extension of the operation. In the days when only such portion of the breast was removed as seemed to be involved in the cancer, the recurrence was almost certain, but the more radical operations, in which the entire breast is removed with the glands from the axilla, as well as the pectoral fascia, have resulted in nearly 50 per cent of freedom from recurrence for three years. Where the glands above the clavicle have been involved the cases have been regarded as quite hopeless, though some surgeons explore the supraclavicular space, even resorting to a section of the clavicle for the purpose. Some eight or ten years ago, before the muscle-removing operations came into vogue, the writer removed all the lymphatic glands that could be reached. By pulling the arm upward the finger can explore the supraclavicular

space behind the sternomastoid muscle. If enlarged glands are found the customary incision is made along the edge of the clavicle to the root of the sternomastoid muscle and a short distance upward along its posterior border. The glands and fat tissue are cleaned out. The breast wound is closed as usual, a small cigarette drain being placed in the hole bored alongside of the vessels. The drain is removed at the end of twenty-four or forty-eight hours. This method of exploration is commended especially, as in nearly one-half the cases enlarged glands could not be recognized before the axilla had been opened. A similar result has followed exploration of the neck, though cancerous involvement in this region is not as frequent as in the axilla.

Treatment for Certain Cases of Enlarged Prostate.—

CABOT, F. *American Journal of Urology,* vol. ii, No. 7, p. 262, April, 1906.

This is a discussion of the surgical treatment of the perilous or emergency cases of prostatic hypertrophy. A preliminary cystotomy by the perineal route should be made under sterile-water local anesthesia. This operation should not consume more than five minutes. With it good drainage is obtained, and there is practically no shock. By the operation rest is given to the bladder, and at the end of a week or ten days a prostatectomy may be performed by either the perineal or suprapubic route. Cases suitable for such method of treatment may be divided into two classes: (*a*) those in which there is extensive disease of the vital organs and the patients are *in extremis,* and (*b*) those in which there has been a suddenly developed inability to urinate and in which the catheter no longer meets the indications. In both these groups of cases free urinary drainage is needed. This is quickest and easiest obtained by entering the bladder through the perineum under sterile-water anesthesia. If for some reason this route cannot be selected suprapubic section should be performed. The prompt drainage of the bladder relieves the condition and the damaged organs have a chance to recuperate. The perineal section gives an opportunity for ascertaining the size and position of the prostate. In this way the character of the second operation can be best determined and the time correspondingly lessened.

The method to be followed in a prostatectomy will depend upon the position of the enlargment, its size, and consistency. The perineal route is the one of choice, as it causes less shock and convalescence is more rapid. In operating by either route continuous hot irrigations should be used through the penile urethra. If such hemorrhage ensues adrenalin chloride can be effectively used by the same channel. The advantages of this method of irrigation are that it can be used continuously without interfering with the manipulation about the wound, and that it lessens hemorrhage and decreases shock.

Laminectomy.—

MCKAY, W. J. S. *Australasian Medical Gazette,* vol. xxv, No. 2, p. 86, February, 1906.

Four cases of laminectomy are reported, one of which is of striking interest, having been done for multiple hydatids of the spinal canal. The tumors in this case were found to be extradural. Compression had involved the integrity of the cord, and there was paraplegia. In all 17 cysts were removed. Two other cases were laminectomy due to caries. A fourth case was for laminectomy for paralysis, in which the symptoms were of a spastic type, and in which the operation was done because there was a slight projection of the spine at the tenth vertebra. The operation in the latter case was of no value. The article closes with a discussion of the justification for laminectomy. In regard to the case of hydatids no other treatment would have given relief. So far only four cases have been operated on suc-

cessfully, still the fact that hydatids are usually external to the dura and usually on its posterior surface shows that there is a fair prospect of cure when the operation is done before the cord is disorganized by compression. The first of the cases of caries was treated by rest and extension after the operation. In that case good health followed for six years. In the second case of caries the patient had been bedridden for eighteen months, during which time there had been no improvement. The operation put her in such shape that she was more comfortable and able to enjoy life. While the operation of laminectomy has been condemned in Pott's disease, it is a procedure that should be resorted to when after treatment by extension and other methods there is no progress.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Citrate of Soda in Infant Feeding.—

SHAW, H. L. K. *Archives of Pediatrics,* vol. xxiii, No. 3, p. 161, March, 1906.

Twelve years have elapsed since Wright published his original article on sodium citrate in infant feeding. In 1904 Poynton wrote on this topic, and since then the subject has been studied by Variot, Ausset, and Guyader. The chemical work done by Shaw revealed no definite reason why the addition of citrate of soda should affect the coagulation of milk. It is not due to the precipitation of calcium salts, as suggested by Wright, but it does affect the character of the curds and the time taken for coagulation when rennet has been added to milk which has been treated with a solution of citrate of soda. When one cubic centimeter of a one-fourth-per-cent solution of citrate of soda is added to five cubic centimeters of milk, and rennet is then added, ninety seconds is required for coagulation, and fine curds are formed. When a one-per-cent solution of sodium citrate is used under similar circumstances five minutes is required, and the curd is found in fine flakes. Larger proportions of the citrate of soda solution prevent coagulation. It is this modification of the coagulating power of rennet that gives it its value in infant feeding.

The clinical trial was made on twenty-two babies, they being kept on citrated milk from three weeks to seven months, the average duration being about four months. The babies were such as are commonly sent to institutions, and were not picked cases, but most were undersized and underweight. The majority were suffering from gastrointestinal indigestion, as shown by a loss in weight, habitual vomiting, and offensive, undigested stools; a number were typical cases of malnutrition. The citrate was given in some of these cases as a last resort, when other methods had failed. Five babies lost in weight and one died, sixteen gained, and one was stationary. Two of the babies among those who lost in weight are still on the citrate and are now gaining steadily. In the one fatal case the feeding had nothing to do with the death. The average gain was from one-half to five ounces a week. In several cases there was an initial loss on first taking the food, which was followed by a gradual and steady gain. The control of vomiting in cases of chronic gastric catarrh was one of the most striking effects of citrate medication.

The preparation of food mixtures was very simple. No attempt at a percentage modification was made. The milk was diluted, the proportion varying from three parts of water and one of milk to three parts of milk and one of water. The water contained ordinary cane-sugar in a five-per-cent solution. The citrate of soda was kept in solution so that each teaspoonful contained 10 grains. This was added to the food in the proportion of

one grain to an ounce of milk. In some cases of habitual vomiting the dose was increased to three grains to the ounce. The milk was neither pasteurized nor sterilized. There was no taste to the citrate even when the proportion was three grains to the ounce, and the babies took the food well. The simplicity of the modification and cheapness of the ingredients make this a valuable method in dispensaries and institutions. In cases of proteid indigestion associated with vomiting and curds in the stools it has a distinct therapeutic value.

The Uterus and Ovary of Neurasthenia.—

DICKINSON, R. L. *Medical Record,* vol. lxix, No. 12, p. 456, March 24, 1906.

This is a study of 100 selected cases, the patients being teachers, musicians, young women and those who were in attendance on sick relatives or older women exhausted by rapid child-bearing, and a few in which the nervous symptoms developed after accident or operation. All were pronounced types of nerve exhaustion of considerable standing. All of the women have lumbar pain. In 65 the uterus is in a normal position; in the remainder of the cases abnormalities exist. The writer protests against offering anteflexion as an explanation for the severe dysmenorrhea of the neurasthenic. There is one retroversion to every five cases in this series. Endometritis chiefly affecting the cervix is commonly found in its milder types. In two-thirds of these individuals ovarian abnormalities exist. It is probable that most chronic neurasthenics have chronic ovaritis, and the removal of such ovaries brings discredit on surgery. In confirmed neurasthenics with prolonged pelvic symptoms the hopefulness of the outlook depends not so much on the operative cure of the few life endangering conditions as upon the measure of the physician's success in persuading patients to live and work contentedly within their limitations.

The Etiology of Tuberculosis in Infancy and Childhood.—

MATHEWS, P. *British Journal of Children's Diseases,* vol. iii, No. 3, p. 96, March, 1906.

The writer has analyzed the statistics of Newcastle Sick Children's Hospital in reference to the incidence of tuberculosis. It was found that nearly one-third of 615 cases admitted had some form of tuberculosis. If, however, the cases of congenital malformation and those which were brought in because of neglect and bad feeding are eliminated the proportion of this infection among those admitted rises to 41 per cent—in other words, quite four-tenths of those admitted for some acquired disease. It is probable that tuberculosis before the sixth month is more frequent than is generally supposed, it frequently not being recognized until the post-mortem examination is made. It is probable that the incidence of tuberculosis in this hospital is rather high, as the admissions are from a thickly populated district where poverty and overcrowding are frequent. The writer carefully studied the histories of 25 cases in which a post-mortem examination was made and tuberculosis found in reference to the possible sources of infection. He contends that no definite assertion can be made as to the origin of the tuberculosis from the fact that the bronchial or mesenteric glands are involved, as the primary trouble may be first in the mesentery with a secondary involvement of the lungs, or *vice versa.* Of the cases in which the mesenteric glands were affected there was a history of constant association with another tuberculous individual in 50 per cent of the cases. It is apparent that a computation of the frequency of infection by milk based on the number of cases in which the mesenteric glands are involved is fallacious, unless careful attention is paid to the history of exposure to infection.

Bilateral Torsion of the Fallopian Tubes.—

STORER, M. *Boston Medical and Surgical Journal,* vol. cliv, No. 11, p. 285, March 15, 1906.

A case is reported in which there was torsion of each tube, that on one side causing quite severe strangulation, but with practically no symptoms, while that on the other side was without strangulation, a condition which he has only found reported three times. It is fairly common to find an ovarian tumor that has undergone several revolutions without interference with its blood-supply. The relative shortness of the pedicle makes such a result far less apt to occur in the case of the tube. While a comparatively rare accident, torsion of the tube occurs much more frequently than the few cases reported would lead one to infer. Rejecting those cases in which the tube is twisted as part of the pedicle of an ovarian tumor, there have been published 62 cases. Bland Sutton first directed attention to this condition in 1890. The symptoms attending strangulation due to torsion are sudden pain, almost always nausea and vomiting, faintness, complete arrest of bowels, and often paralysis of the bladder, combined with local tenderness and increase of the size of the tumor from venous congestion. The symptoms are not distinctive. Of 37 cases in which the diagnosis before operation is given, in only one is the claim made that the true condition was recognized. The correct diagnosis can probably be made only when it is known that a hydrosalpinx has undergone a rapid increase in size, especially if a previously pelvic tube has become abdominal.

No satisfactory theory to account for torsion has been given. In a few cases sudden, stabbing pain has followed muscular exertion of one kind or another, but in the majority of them nothing of the kind is alleged. To have torsion occur the tumor must be situated in the distal portion of the tube, and it must be free from adhesions. The pedicle must be thin and relatively long. The tubal tumor must be fairly high in the pelvis. A pelvic tumor favors torsion of the tube. Of 60 cases torsion was associated with myoma in four, with pregnancy in three, with an extra-uterine pregnancy in the other side in three, while in a number difficult to determine the other tube was more or less enlarged with serum or pus. The tube is sometimes twisted half-way around, the average being about one and one-half twists. In one instance reported there were 5½ turns. The ovary was involved in 18 cases, the symptoms being apparently more severe where such was the case. The immediate and definite results of strangulation of the tube are an effusion of blood into its cavity, combined with extravasation into its walls, adhesions to surrounding parts, and probably subsequent infection from the intestine. It is possible that many cases of twisted tubes may have been looked upon as extra-uterine pregnancies because the tube was found filled with blood. The only treatment for the condition is immediate operation. In the 62 cases there were only two deaths, one from ileus fourteen days after operation, and another forty-eight hours after operation from an unknown cause.

Periodical Vomiting with Acetonuria in Children.—

British Journal of Children's Diseases, vol. iii, No. 3, p. 87, March, 1906.

The clinical picture of periodic vomiting of childhood with acetonuria is well recognized on the continent, but it has attracted little attention in England. Frequent references are found in American medical literature, the earliest paper being by Snow in 1893. The writer prefers the term periodic vomiting, and describes the clinical picture as follows: In the midst of perfect health without apparent or appreciable cause the child is suddenly seized with vomiting. It is a regurgitation

without premonitory nausea, the fluid being watery at first, and later alimentary or bilious. The vomited matter, at first abundant, diminishes by degrees so that at the end of the attack the stomach is empty. Attacks of this kind happen several times a day and recur with variable frequency. The whole attack lasts from two to five days, but is sometimes prolonged for from two to three weeks. Once at an end it leaves no after-effect save some slight fatigue. The child becomes cheerful, the color returns, and there is little appearance of a serious illness. After a variable time, a few days to a few months, the attacks of vomiting are renewed with the same symptoms, and the illness may continue for years, discontinuing about the time of puberty. The symptoms associated with the vomiting are variable. Usually at the onset of the attack the face is pale and drawn, the eyes sunken, the abdomen retracted, and the patient lies motionless. Very often at the beginning of the attack the bowels are constipated, less frequently there is diarrhea, the tongue is slightly coated, the pulse is usually accelerated and it may be irregular. The temperature may be slightly above normal. Gastric pain is almost always absent. Thirst is intense, but the smallest quantity of fluid is sufficient to provoke a fresh attack. While the child absorbs very little liquid, yet a large quantity is ejected by vomiting, the body becoming dehydrated, which accounts for the thirst. An important diagnostic point is the retention of the appetite, which distinguishes it from most other acute gastrointestinal disorders of childhood. During the attack the breath has a distinct smell of acetone, sometimes so marked as to be noticeable to any one entering the sick-room. The urine is scanty; it contains acetone, and often indican. Daily analysis of the urine should be made from the beginning of the attack. The fact that this symptom has not been observed by some writers is due to relying on an examination of a single specimen of the urine.

In discussing the various theories of the disease the writer comes to the conclusion that it is due to some toxic substance produced by defective metabolism which accumulates in the tissues and which acts on an unstable nervous system. The diagnosis is not difficult, and the prognosis is almost always favorable in the absence of complications. The treatment has for its object the cutting short of the attacks and their prevention. Edsall gives bicarbonate of sodium in large doses, a treatment which has been followed by Pierson, Shaw, and Tribe. The diet should be regulated, and the general condition improved by hydrotherapy, exercise, and fresh air.

Buttermilk as an Infant Food.—

RAMSEY, W. R. *St. Paul Medical Journal,* vol. viii, No. 3, p. 143, March, 1906.

The writer's attention was directed to the value of buttermilk in Baginsky's clinic in Berlin. He has employed it in about 30 cases, partly in hospital and partly in private practice. He has varied Baginsky's directions, diluting the buttermilk according to the conditions present in a given case. In a few cases in which there was marked colitis the buttermilk caused constipation. This, however, was only temporary. When the condition of the infant improves and the stomach becomes more tolerant, cream may be added with advantage. The length of time children may be kept on buttermilk varies. In two cases the writer has given it for seven months, each case doing badly on any attempt to return to ordinary modified milk. Both of these cases are above the average in development. Although they have been watched carefully no symptoms of rickets or other nutritional disturbance have been noted. In using buttermilk it is most important that it should be

fresh. Buttermilk secured from creameries where they churn daily and where the cream is soured to a specific degree is wholesome, providing it is fresh. As soon as the buttermilk is secured, if it is boiled and placed on ice it may be kept for two days. Where fresh buttermilk cannot be procured from the shops cream may be purchased from the dairy and churned at home. Buttermilk is not only of use in the treatment of sick children, but is an excellent food for well babies. A baby may be taken from the breast when the milk disagrees and placed on buttermilk, when it will gain in weight from the first day. The lactic acid in buttermilk has bactericidal properties. It has been shown that tubercle bacilli will not live to exceed two days in buttermilk which has not been boiled.

Metrorrhagia Myopathica.—

University of Pennsylvania Medical Bulletin, vol. xviii, No. 12, p. 322, February, 1906.

The writer has given an exhaustive study of this condition, which he thinks should rank as a distinct type of disease, as it is a metrorrhagia which is immediately dependent upon anatomical or physiological lesions of the uterine muscle. The anatomical lesion has as yet not been demonstrated, but it will probably be found in the elastic tissue constituents of the vessel walls and the subserous and supravascular layers. The physiological lesion is probably in insufficient contractile power of the uterus. It is possible that this may be purely functional. In cases of metrorrhagia myopathica the uterus is enlarged, softened, and the os is patulous. The condition does not occur in nulliparous women, and therefore it must have some connection with child-bearing. The diagnosis of metrorrhagia myopathica is only justified when all other possible causes of uterine hemorrhage have been excluded. The terms apoplexy uteri, senile endometritis, and preclimacteric bleeding as applied to these cases are incorrect and unscientific. While curettement has little effect, palliative measures should always be tried before hysterectomy. Obliteration of the endometrial cavity is harder to perform than hysterectomy and is more dangerous.

Barlow's Disease in the Island of Cuba.—

DUENAS, J. L. *Archives of Pediatrics,* 23d year, No. 3, p. 170, March, 1906.

Cuban medical literature has no data in reference to infantile scurvy. In 1901 the writer published some clinical notes on the disease, and since then he has devoted considerable attention to it. He has found that it exists on the island and has the same features that are assigned to it in other countries. It is apparently less frequent than in other parts of the world, though probably this is due to a failure to recognize the clinical type of the disease. The disease has developed in children fed upon boiled cow's milk, sterilized cow's milk, condensed milk, and maternal milk. The exact causes underlying the development of the disease in different cases are still unknown. It is probably some noxious element contained in the milk or possibly due to a defective elaboration of the ingested material. There is apparently some functional deficiency in the individual which acts as a causative factor. It is probable that scorbutic anemia and the hemorrhagic conditions associated with it are due to a chemical rather than to an infectious agent.

Ataxia in Childhood.—

BATTEN, F. E. *Brain,* parts cxi and cxii, p. 484, Autumn and Winter, 1905.

The writer has studied a series of cases of ataxia excluding Friedreich's syndrome, the ataxia which occurs in tumors and lesions of the cerebellum and midbrain, and in certain cases of diphtheric paralysis. Based on the

clinical type the remaining cases are classified as cerebellar diplegia, which are divisible into three main groups: (1) Cases in which ataxia has been noticed from earliest life and in which there is a tendency to gradual improvement. (2) Cases in which ataxia has suddenly developed during the course of or after some acute illness in a child who was formerly quite healthy. The prognosis in these cases is relatively good. (3) Cases in which ataxia has gradually developed in a child who has been healthy and of normal development until the onset of the disease. This is the progressive cerebellar ataxia, and the prognosis is bad. In all of these cases the cerebellum seems to be the organ that is primarily affected, though it may be associated with other lesions.

Mastoiditis in Infants.—

OPPENHEIMER, S. *Medical Record,* vol. lxix, No. 10, p. 372, March 10, 1906.

There are certain differences in the temporal bone of the child and the adult which account for the peculiarities in the reaction of inflammation in the mastoid tissue of children. Mastoid involvement in infancy has received little attention, due to the fact that the mastoid antrum may be filled with pus and the leading symptoms of ear involvement be absent. Many deaths of infants are due to this cause, the condition being unrecognized. The pathological consequences of infection of the mastoid in infants are the same as in adults, though in early life there is a tendency to greater destruction of the bone. There are acute forms of this disease which are not accompanied by grave physical depression. There are other groups in which the purulent inflammation is subacute. The latter type is not usually connected with the exanthemata. There may be a gradual sagging of the posterior wall of the external auditory canal like that of the adult type. In many cases the only evidence of ear affection is to be gained from a careful study of the child for several days. There should be a careful examination of the ear in all sick infants no matter what the disease.

A Factor in Perineal Lacerations.—

SHIPPS, W. H. *Medical Record,* vol. lxix, No. 7, p. 261, Feb. 17, 1906.

Violent and uncontrolled expulsive efforts just prior to the birth of the child play an important part in causing perineal rupture. The unwise advice of friends in the effort to have an early termination of labor leads the patient to make voluntary expulsive efforts. This hastens the terminal stage of labor and does not admit of a physiological softening and stretching of the tissues. The patient should be assured that the pains which are apparently accomplishing little are in fact preparing a way for the birth of the child, and she should be warned that in the period just prior to delivery all voluntary efforts should cease. The integrity of the perineum depends largely upon the thorough control of the last expulsive efforts of the patient.

Displacement of the Fallopian Tubes to Produce Sterility.—

ROCKEY, A. E. *Medical Record,* vol. lxix, No. 11, p. 423, March 17, 1906.

In certain cases pregnancy should be avoided, as it would expose the patient to great danger. An operative method of securing sterility is to displace the Fallopian tubes. To perform this operation the cornu of the uterus is brought into the field of incision, and the tube is seized near its uterine end with forceps. The sharp point of a pair of scissors is thrust into the cornu, and the uterine end of the tube is cut out by a V-shaped incision with two cuts of the scissors. The wedge-shaped point of the excised end of the tube is caught with the forceps, drawn out a little between the partly

closed blades of the scissors and cut off. The severed end of the tube will then slip into the peritoneal sheath and be completely covered by it. One catgut stitch is passed through this cuff, then through the fundus posterior to the inner end of the V-shaped incision, and tied, thus fastening the closed ends of the tube back of its original postition. Two more stitches are passed around the tube and through the cornu to close the incision and control the bleeding.

FORENSIC MEDICINE.

Construction of a Health Policy as to Blood Poisoning.—

Journal of the American Medical Association, vol. xlvi, No. 11, p. 830, March 17, 1906.

The terms in which health policies and in some instances accident policies are drawn are so obscure and misleading that they are difficult of construction. In Jones *vs.* Pennsylvania Casualty Co. the Supreme Court of North Carolina has held that the limiting clauses in a policy had no application when it was the plain intent of the contract to furnish indemnity for a certain class of diseases. A holder of a health policy received a small scratch on the hand which began to inflame. Blood poisoning ultimately developed and amputation was necessary. The policy contained a definite stipulation for indemnity in case of disability arising from certain specified diseases, blood poisoning being one expressly named. The policy gave this assurance of indemnity, but later took up the matter of provisos by way of instruction, and stipulated (1) that the policy should not apply to any illness or disease whatever except those named; (2) that it should not apply to any disease which was complicated with or resultant from any disease not therein named; (3) nor to any disease or illness which resulted from injury; (4) nor to any disease which developed or resulted from those diseases that were named. There were many other limitations in the policy, but those set out were enough to show that if these provisos could prevail blood poisoning was withdrawn from the operation of the policy.

The court said blood poisoning is not a primary or idiopathic disease. It is a toxic condition of the blood caused either from or through a surface wound or some internal lesion, or from the breaking down of tissue incident to and existent on precedent disease and thereby producing suppuration. As to this disease, therefore, these provisos removed every possible condition where the disease could occur, and if upheld would set aside the definite contract for indemnity contained in a former clause of the policy. It is an established custom to construe such policies in favor of the insured. It is also well established that while clauses in a contract apparently repugnant must be reconciled if it can be done by any reasonable construction, yet a proviso repugnant to the body of the contract should not be considered. A subsequent clause irreconcilable with a former clause and repugnant to the general purpose and intent of a contract should be set aside. In the application of these principles to the case under consideration the court held that the provisos were repugnant to a definite stipulation of indemnity contained in the body of the contract, and hence could not be relied on to prevent the plaintiff's recovery.

Belladonna Poisoning Due to Belladonna Plasters.—

Doland, C. M. *American Journal of the Medical Sciences,* 131, No. 4, p. 623, April, 1906.

Scant attention is given this subject in the text-books, though Wood says that constitutional symptoms may be produced by the external application of belladonna ointment, and advises that patients should be warned to remove plasters if dryness of the throat or dis-

orders of vision come on. Three cases of poisoning by the external application of belladonna are reported. A man 47 years of age was brought to the hospital by the police. He was violently delirious, tossing about, and had to be strapped in bed. The pupils were widely dilated and did not react to light. There was a diffuse erythematous eruption on the chest and back. It did not punctate nor fade on pressure. Four belladonna plasters were found on the shoulders, back, and abdomen. A small quantity of brownish fluid was vomited. The mouth and tongue were dry, and the inner surfaces of the lips were dry and parched. The pulse was 144, temperature and respirations normal. The diagnosis of belladonna poisoning was based on the condition of the pupils, the rash, dryness of the mouth, and the presence of the plasters. Three hours after admission the patient was nearly rational. Sleep was fairly good the first night following a one-sixth grain hypodermic injection of morphine. The following morning the rash had nearly disappeared. The pupils were still dilated, but there was a partial reaction to light. Accommodation was also paralyzed, and the patient could not read ordinary print held at eight to twelve inches. It was learned that the patient had worn two of the plasters for several days, but two more had been applied late in the afternoon of the day on which he became delirious. A second case occurred in the practice of Dr. Stengel, who when called to the patient found him semiconscious, with incoherent muttering. The speech was thick, so that the suspicion of an epileptic condition was entertained. The history was that this state had begun some time in the night. The face was flushed, pulse full, bounding and rapid. The temperature was between 99° and 100°. It was found that the patient had placed two belladonna plasters over his back, and these had been in place for several days. After removal of the plasters the condition gradually improved. The erythematous rash, which spread from the face to the upper part of the body, subsided. The mouth, which had become dry, grew moist, and the stupor gradually cleared away. A third case occurred in the hospital. A small belladonna plaster was placed on the chest of a woman. Two hours later she was highly excited, pupils dilated, mouth dry, and had a diffuse erythematous rash on face, shoulders, and chest. The plaster was removed, and in a few hours the rash faded and the excitement ceased.

Demonstration Before Jury of Nature of Injuries.—*Journal of the American Medical Association,* vol. xlvi, No. 12, p. 911, March 24, 1906.

Ordinarily courts are chary of exhibitions before juries. How far such exhibitions may be allowed has been largely left to the discretion of the trial judge. It is obvious that the exhibition to the jury of an amputated limb, scars, or other clearly objective signs of disease is proper. How far a jury would be able to judge of a gait of a plaintiff or some other symptom that may be feigned is a matter upon which there is a wide difference of opinion. In a Texas case the trial court seems to have reached the limit in a theatrical exhibition to a jury of a patient's disabilities (M. K. and T. Railway Co. *vs.* Lynch, Texas Civil Court of Appeals). While a physician, the plaintiff's witness, was on the stand he demonstrated a loss of sensation in the legs. He stuck pins into the plaintiff's limbs in various places, and continued to do so until the blood was running freely from one place in the limb. He offered to light a match and hold it under the plaintiff's limbs to show that there was no sensation, but stated that it would blister. The plaintiff while standing in front of the jury on one crutch had it forcibly removed, allowing the plaintiff to fall nearly to the floor,

whereupon the witness, who was a strong man, caught the plaintiff, raised him up and then again let him fall, catching him just before he struck the floor. To these proceedings the defendant company objected on the ground that they were improper and calculated to prejudice the minds of the jury. The objection was overruled and the evidence admitted. It was held by the Court of Appeals that whatever effect such an exhibition may have had upon the jury would only go as to the amount of damages, and if there was no complaint made that the verdict was excessive, therefore there was no reason for reversing it on account of these alleged errors.

Poisoning by Orthoform.—

SCHMIDT, A. *Montreal Medical Journal,* vol. xxxv, No. 3, p. 189, March, 1906.

A painful varicose ulcer of the ankle was treated with orthoform, which in a few minutes relieved the pain. The powder was employed for two weeks, when there developed an eruption on the face, and later covered the scalp, trunk, and limbs with pinkish-red papules. Pink wheals and erythematous patches were found on the neck and chest. The skin around the ulcer was a pinkish-yellow and the ulcer was gangrenous. The pulse ran up to 120 and the temperature to 102.4°. The tongue was clean, but there was some headache. The ulcer was very painful.

Acute Acetanilide Poisoning.—

TYRRELL, J. B. *Journal of the American Medical Association,* vol. xlvi, No. 13, p. 955, March 31, 1906.

The patient was 52 years of age and suffered from severe chronic headache. Not obtaining relief from headache pills and powders he purchased an ounce of acetanilide in bulk and took a half-teaspoonful. The headache disappeared in a short time, and he then went out on the street. While walking he felt weak. He then went to a barber shop, and the man who shaved him noted that he had a "terrible blueness." He then entered a store, where in a few minutes he was seen to sway and fall to the floor. He was found in deep syncope, extremely cyanotic, with a feeble and rapid pulse. He was readily resuscitated, but in a few minutes there was another attack of syncope, which was repeated a number of times during the next few hours. He gradually recovered.

PUBLIC HEALTH.

The Public Health Laboratory.—

WESBROOK, F. F. *American Medicine,* vol. xi, No. 9, p. 309, March 3, 1906.

The function and scope of the public health laboratory is discussed and laboratory workers are grouped into classes. These are: (1) Consultants in laboratory practice whose chief activities are directed in the line of diagnosis in which the laboratory worker and the practitioner must coöperate. This phase of the practice of medicine has not been fully recognized, and laboratory workers have not yet been assigned their proper places with the other consultants in medicine. (2) It is important that research laboratory work should be carried on in the cause, prevention, and method of transmission and cure of disease. (3) Teaching positions in connection with university medical schools which should not be divorced from research both on account of the laboratory workers and of the students whom they instruct. (4) Hospital laboratories for the proper working up of cases which are at the same time thoroughly studied clinically, and of which full records are made. The value of such work is becoming increasingly apparent, and statistics based on such studies are of great value. (5) Public health laboratories as a part of the public health service maintained for the purpose of locating foci of disease and eradicating them.

Plumbism from the Ingestion of Diachylon as an Abortifacient.—

HALL, A., and RANSOM, W. B. *British Medical Journal,* No. 2356, Feb. 24, 1906.

In the neighborhood of Leicester cases of lead poisoning have been noted for a number of years which could not be traced to the ordinary sources of plumbism. The cases were limited to women of child-bearing age, and eventually the source of the poisoning was traced to the use of diachylon as an abortifacient. An extensive correspondence with practitioners in the neighborhood of Leicester has shown that the custom is wide-spread, though necessarily these replies do not reveal its full extent. It seems that it started twelve years ago in and about Leicester, and spread to the adjoining three or four counties. Its extent seems to indicate that it has been handed from person to person rather than by wholesale advertisement. Certain largely advertised patent remedies sold as "female pills" contain lead, but it is probable that these are not largely responsible. It does not seem to be any particular pill or medicine, but the secret information that diachylon is a safe and sure abortifacient. Among the suggestions for preventing the spread of the evil it is proposed to inform the profession of the use of this substance that the laity may be generally informed of the danger of the practice, and also to control or prohibit the sale of diachylon.

Experimental Method in Sanitary Science and Sanitary Administration.—

SEDGWICK, W. T. *American Medicine,* vol. xi, No. 10, p. 347, March 10, 1906.

Experience in sanitation must largely take the place of experiments. Comparatively few physicians or sanitarians are in a position to conduct artificial experiments. Any wide-awake observer will find going on all about him natural experiments, the conditions of which may often be learned with great accuracy, even after the experiment is completed, and which may yield conclusions quite as capable of verification as the experiments made in the laboratory. This is a matter that should give encouragement to the younger workers. Better material should be found on our boards of health, which should cease experimenting with political appointees and spoilsmen. Too often the local boards of health are made up of a hack politician, a couple of second-rate doctors, and one or more place-seeking nobodies. The services of such boards are disgracefully small in quantity and poor in quality. The present plan in the formation of health boards has been experimentally demonstrated to be faulty, and it should be abandoned.

Without Mosquitoes There Can Be No Yellow Fever.—

CARROLL, J. *American Medicine,* vol. xi, No. 11, March 17, 1906.

The facts that have been observed regarding the distribution of yellow fever show conclusively that the parasite of the disease, whatever it may be, belongs to the animal kingdom. It is necessary for its continued existence that it pass alternately through man and the mosquito, and its parasitic existence in these hosts is obligatory; that a period of two weeks must elapse before the contaminating mosquito is capable of infecting points to a definite cycle of development in that insect. The limitation of its development to a single genus and to a single vertebrate conforms to a natural zoölogic law, and does not agree with our present knowledge of the life history of bacteria. The effects of climate and temperature upon stegomyia and upon the rate of development of the yellow fever parasite within the body of the insect are the same as those noted in reference to the anopheles mosquito and the malarial parasite.

B.J.C.D.

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EDITORIAL.

MARINE CLIMATES.

The value of marine climates has long been recognized in the treatment of certain diseases. The sea air has been recognized as a tonic useful in tuberculosis and other infectious conditions. It has been a common observation for generations that sailors, notwithstanding the bad hygiene of the forecastle and a by no means generous diet, are peculiarly immune to infectious diseases, and one chronic infection among them, namely lues, is notoriously benign in its manifestations. The prescription of a long sea voyage was not uncommon twenty-five years ago, though it has somewhat yielded to the fashionable preference of Egypt for Europeans and of Southern California for Americans. The sea voyage has been recently revived by a German, who proposes to fit out a specially equipped ship for the benefit of the tuberculous. It is surprising in view of the well known value of sea climates that so little attention has been devoted to island climates. Jamaica has long been a favorite with English people, and also with the residents along the Atlantic seaboard. It, like other islands situated in the Gulf Stream, has a warm but not enervating climate, there is freedom from dust, and the range of temperature is narrow.

G. S. S. Hirst, in the *Lancet* of April 14, 1906, calls attention to the Turk's and Caicos islands as a resort for cases of pulmonary tuberculosis. Since 1873 they have constituted a dependency of Jamaica, and geographically they belong to the Bahamas group of islands. Grand Turk, the capitol of the dependency, is in direct communication with New York by the Clyde line of steamers. The advantages of these islands have been overlooked by invalids. They have an equable climate, with a never-failing breeze day and night, and living is cheap. There are about 500 white people on the islands, the most of whom were born there. There have been only two hurricanes in the last forty years. The summer and winter temperature is practically the same, the variation being about ten degrees between the highest and lowest temperature noted. A cloudy day is scarcely known, though the rainfall at certain times of the year is considerable. The prevailing disease is rheumatism, though the attacks are mild and readily yield to treatment with salicylate of sodium. Among the black population pulmonary tuberculosis is by no means uncommon, but it is due to the exceedingly unsanitary condition in which these people dwell. The food supply is rather indif-

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All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

ferent as to meat, but there is an abundance of eggs and fruit. Boating can be indulged in to any extent; the sea between the islands is rarely rough. Sea bathing is delightful, and of fishing there is an abundance.

The island climates have been overlooked. They present all the advantages of a prolonged sea voyage without the attending discomfort of narrow quarters and a more or less restricted dietary. The further advantage of freedom from seasickness is by no means inconsiderable.

PRECOCIOUS DIAGNOSIS.

The importance of the early recognition of tuberculosis is being dinned into medical ears with an enthusiasm worthy of so good a cause. The superintendents of sanatoria everywhere are urging that cases of tuberculosis should be sent before the diagnosis is confirmed, for a suspicion of tuberculosis is easier to cure than the certainty. To wait until there is dulness on percussion, the bacilli can be recognized in the sputum, and there is hectic and night sweats, is to miss the favorable initial opportunity of treating the disease.

Edward Martin in the *University of Pennsylvania Medical Bulletin* for March, 1906, calls attention to the importance of precocious diagnosis in surgery. He says that if a leading surgeon of twenty-five years ago had fallen asleep and should awake to-day he would be impressed with the low mortality from formidable surgical operations. That this is in part due to more cleanly methods and the more rational management of shock and hemorrhage would be recognized, but it is due more largely to an early diagnosis and hence earlier interference. He says that the surgical diagnosis is not made earlier owing in part to the present methods of teaching students. They are taught to look for the fully developed disease rather than to search for those symptoms which characterize the beginning of the disorder. He claims that many lives would be saved if the student were taught that every tumor of the breast occurring in middle age was potentially a carcinoma. To wait for the classical signs of the disease, such as retracted nipples, skin adhesions, and axillary lymphatic enlargements, is to lose the favorable time for operating in carcinoma. Failure in early diagnosis is often dependent upon a want of coöperation between the medical man and the surgeon. From a surgical standpoint he lays down what he describes as certain rough diagnostic rules, which if strictly adhered to in some cases may perhaps lead to error, but they often suggest a timely diagnosis:

1. All apparently causeless, circumscribed, chronic ulcers persisting in spite of cleansing and protecting local treatment for more than two weeks should be regarded as possibly syphilitic, tuberculous, or malignant. To this rule there are many exceptions, the majority of them obvious, such, for instance, as in the case of varicose ulcers occurring about the malleoli. Where there is reasonable doubt the diagnosis should be made promptly by the tuberculin injection, the administration of mercury or mercury and iodides, or excision of a portion of the ulcerated surface and microscopic examination.

2. All non-inflammatory toumors of the breast should be regarded as probably malignant. The positive diagnosis should be made at once by excision and microscopic examination of a frozen section.

3. Pain and tenderness in the abdominal cavity, if persistent or persistently recurring and sharply localized, if not accounted for by a recognized medical condition, and particularly if crippling in its recurring exacerbations, should suggest surgical operation. This is particularly the case if the pain and tenderness are associated with muscular rigidity.

4. Chronic diarrhea, characterized by small, fluid passages, attended by some tenesmus:

these symptoms, being particularly marked on rising in the morning, should suggest a rectal examination and a laboratory study of the stools.

5. Persistent, sharply localized pain and tenderness in a bone after trauma should suggest a fissured fracture; diagnosis to be confirmed or disproven by *x*-ray examination.

6. Persistent, severe, localized headache should suggest tuberculous, syphilitic, or malignant infiltration of the brain.

7. Persistent, apparently causeless, sharply localized pain and tenderness in either a bone or joint should suggest tuberculosis, syphilis, or, in the case of a bone, malignant infiltration.

DIET.

The question of vegetarianism is occupying considerable attention in the medical world, and a far larger share of attention at the hands of certain special cults, who have adopted it as one of the corner-stones of their practice. H. Campbell (*Clinical Journal,* March 14, 1906) undertakes to answer the question as to how far a man should be regarded as a vegetable feeder and how far as an animal feeder. He divides the mammalia in respect to diet into three classes: (1) the purely flesh feeders, or carnivora; (2) the purely vegetable feeders, which include the herbivora and many of the frugivora; and (3) the mixed feeders. The herbivora, like the horse, ox, and rabbit, subsist on bulky food, such as grass, leaves, and the like, and have a correspondingly bulky digestive system. The frugivora, which include such animals as the squirrel and the monkey, consume a more concentrated vegetable food, such as is found in seeds and nuts. Being more intelligent than the herbivora and gifted with considerable prehensile powers they are able to pick and choose their food, consequently their digestive systems are much less bulky than the herbivora. Many of the frugivora partake of animal food. Squirrels consume eggs as well as nuts, and many of the monkeys supplement their vegetable diet by small birds, lizards, grubs, and the like.

Man has unquestionably descended from a being closely allied to the present-day anthropoids. The latter are essentially frugivorous, subsisting chiefly upon concentrated vegetable food, such as nuts and seeds, young shoots, and fruits. In addition they consume animal food, such as birds, snakes, lizards, eggs, insects, and grubs. It is safe to assume that our simian forbears were essentially frugivorous, though to some extent carnivorous, and must be classed among the mixed feeders. The most primitive peoples of to-day have not yet reached a stage in which they produce food of animal as well as vegetable origin, but subsist on wild foods, such as fruits, seeds, roots, and such animal food as they can procure by hunting and fishing. Such primitive peoples, speaking generally, consume about equal parts of animal and vegetable substances, though considerable differences exist between them. The Esquimau of necessity is almost wholly carnivorous, while certain Indian tribes have a diet consisting of about two-thirds vegetable and one-third animal food. The point of interest in the diet of these primitive peoples before they begin to breed animals for food or to cultivate the soil is that none of them are purely vegetable feeders. The uncultivated vegetable kingdom does not by itself afford adequate sustenance for man, even though he understands how to increase the yield of vegetable food by special methods of preparation by which objectionable ingredients are removed, and by cooking the cellulose framework of vegetable tissue is so broken up as to liberate the starch and other foodstuffs. The discovery of cookery was an epoch in man's history by which vast storehouses of nutriment were made available. Notwithstanding this,

primitive peoples must supplement their diet from the animal kingdom, and are essentially hunters and fishermen. If the anthropoid ancestors of man were frugivorous it is evident that his carnivorism must have increased up to the time when he began to prepare vegetable food in special ways. He was in fact a wandering hunter until the period of fixed agriculture was reached and he became rooted to the soil. While leading the life of a hunter he was most carnivorous, and during that time his habits were best suited to a highly animalized diet.

The application of these doctrines shows that man as he now exists should be a mixed feeder. When leading a nomadic life he is capable of disposing of large quantities of animal food, but a more sedentary existence calls for a larger proportion of vegetable food. While man is so largely carnivorous it must not be forgotten that certain individuals differ in their power to cope with animal food. It is certain that much of it is bad for some, and not a few thrive best on a diet that is almost wholly vegetable. Civilized man is in a much better position to exist on a purely vegetable diet, as he is able to extract albumen, fat, starch, and sugar from vegetables in large quantities. It is thus possible for him to obtain from the vegetable kingdom such foods in ample supply for his full nutrition. It must not be forgotten that most so-called vegetarians consume large quantities of milk, butter, and cheese, as well as eggs, all of which are derived from the animal kingdom. The eating of animal food may be objectionable to some, but it was on a highly animalized diet that man evolved from his simian ancestors. The entire human race may some day be able to subsist on vegetable food alone, but the difficulties in the way, which are economic rather than physiological, would seem to be insurmountable.

THE MAKING OF AN AUTOPSY IN ORDER TO PROCURE A BURIAL PERMIT.

The necessity of an autopsy to ascertain the cause of death may give origin to some dispute between the attending physician and the family. The leading decisions in regard to a human body hold that it is not property in the ordinary sense. It cannot be disposed of by will, it cannot be the subject of a replevin, and the only interest which the surviving relatives have in a body is that which custom ordains—permitting the last rites for the dead and such decent and seemly disposal of the remains as is appropriate. In a recent decision the Court of Appeals of Kentucky (Myers *vs.* Clarke: *Journal of the American Medical Association,* April 28, 1906) has gone into the question of an autopsy for the purpose of obtaining data for a certificate of death. The action was brought by a mother to recover damages for an alleged unauthorized autopsy on the body of her daughter, who had died suddenly at a charity hospital. An undertaker was sent to the hospital to remove the body. After conference with the interne at the hospital he went to the home of the girl and notified the parents that the body was in bad condition and that a speedy burial was necessary, and stated that the physicians of the hospital had to make an autopsy to ascertain the cause of death in order to procure a burial permit. Before the undertaker could communicate with the physicians the autopsy had been made, which disclosed that death was due to perforation of the bowels caused by typhoid fever.

The jury in this case were instructed that they should find for the plaintiff unless the physicians acted in good faith and for the sole purpose of ascertaining the cause of death that they might be able to correctly certify it to the proper authorities. They were further instructed to find for the plaintiff unless they believed from the evidence that the autopsy

was properly and decently performed, with due regard to the sex of the deceased and without unnecessary mutilation of the body. They were also instructed to find against the undertaker if they believed from the evidence that after having custody of the body he consented to the autopsy being made. Further instructions were given that they were to find for the defendants providing the autopsy was made in good faith for the purpose named, and that there was no unnecessary mutilation. The upper court held that these instructions were valid, and they affirmed the judgment, which was for the defendant. It says that there was nothing in the record to show that the undertaker or the physicians purposely mutilated the body, but that their sole purpose was to comply with the rule of the Board of Health so as to enable the undertaker or physician to procure a burial certificate. The court saw no reason why the city authorities and the Board of Health should not make such requirements.

EXPLOSION OF A RADIUM TUBE.

It would seem as if radium had not exhausted its surprises. That it exerts considerable pressure on the container in which it is enclosed is attested by the unique experience of Robert Abbe (*Medical Record*, April 21, 1906). He had 50 milligrammes of pure radium bromide which was contained in a small glass tube 3 millimeters in diameter and 2.5 centimeters in length. The thickness of the walls of the tube is not stated. This glass tube was enclosed in a silver case. In removing it from the latter it caught at the opening and was slightly pressed with the forceps, when the tube exploded with a loud report. All of this fine specimen of radium, which had an activity of 1,800,000, was finally recovered; the major portion of it was found in the metallic tube, and the balance fell upon the carpet. The portion of the carpet on which the radium fell was cut out and fastened over a drum, and the particles of radium were beaten from it so that they were all subsequently recovered. Abbe's theory of the explosion is that it is due to the accumulation of positive electricity in the tube. The radium was placed in a new container, in the wall of which a fine platinum wire was fused. It is thought that this will discharge the positive electricity and so maintain an electrical equilibrium in the tube, the negative electricity being constantly carried off with the beta rays through the walls of the glass.

THE DEATH-RATE FROM TUBERCULOSIS.

In the Bulletin of the Chicago Health Department of April 7, 1906, is a discussion of the falling death-rate of tuberculosis in Chicago during the past fifty years. During 1905 the death-rate was 16.1 per 10,000 of population, while in 1856 it was 26.7. At that time Chicago was a small city. It contained few large manufactories, and apparently the conditions favorable to the spread of tuberculosis were less favorable then than now. It is difficult to estimate a possible fallacy in these statistics, namely, the failures in diagnosis. It was prior to the identification of the tubercle bacillus, and it is possible that many wasting conditions were put down as tuberculosis which were not really such. It would seem as if this would be counterbalanced by the increased accuracy in later years, by which a number of tuberculous conditions have been recognized which were not formerly so classed. The figures as they stand are a distinct encouragement to the antituberculosis propaganda. A tuberculosis exhibit is now being held in Chicago which must have a far-reaching influence not only on tuberculosis, but other diseases which are dependent upon bad hygiene and imperfect nutrition. The Bulletin calls attention to the fact that the Health

Department of Chicago issued the first circular by a public health department (July, 1895) in which attention was called to the cause and methods of preventing the disease. The language of this circular was criticized at the time, as it was thought to take radical ground regarding the non-hereditary nature of tuberculosis and the possibility of its being disseminated by contagion. In commenting on this position Osler says: "While the demonstration of the contagiousness of tuberculosis has in some quarters intensified the dread with which the disease is regarded, the terrible Ate of hereditary transmission has been in great part abolished, to the great gain of suffering humanity."

KOPLIK'S SPOTS.

It seems that these peculiar spots are destined to bear Koplik's name, and it is conceded that they are of diagnostic importance. While not the first to observe them Koplik deserves credit for having published an accurate description of the spots and indicated quite fully their diagnostic importance. Bing in a recent monograph points out that they have not been accorded in French pediatric literature the diagnostic importance which they should have. Attention is called to the characteristic appearances which alone entitle them to the term of Koplik's spots, and which only are indicative of measles. The spots should have a rose-colored periphery with a bluish-white center. He has made a study of 1400 infants in the Trousseau Hospital suffering from various digestive and nervous affections as well as the exanthemata, and in no case were such spots found unless the case was developing measles. Koplik's spots are very rarely observed for the first time coincident with the skin eruption. Nearly two-thirds of the cases are seen on the second and third days preceding the eruption. A moderate number are observed to appear the day before the eruption occurs. It is this early appearance of the spots that gives them such importance in the diagnosis of measles, thus early differentiating it from other febrile conditions. It is well to remember that the diagnostic value of Koplik's spots depends upon the positive findings and not on the negative. When the characteristic spots appear it is pathognomonic of measles, but the disease is not to be excluded by their absence, as they may not appear during the entire course of the disease.

THE NATIONAL PURE FOOD BILL.

The passage of the national pure food bill was necessary to supplement State inspection. A very considerable amount of adulteration has been carried out with especial reference to avoiding the State laws. Grossly adulterated foodstuffs have been extensively manufactured for the express purpose of shipping them across the State line, the manufacturer not being reachable by the food laws of the State in which they were sold to consumers. Adjoining States could thus go on poisoning each other's population indefinitely. Of course dealers could be fined for selling impure foods, but as a matter of fact the laws should reach the real culprit, the manufacturer. With a good national pure food law to protect interstate commerce, local laws can be relied on to afford consumers relief from the iniquities of manufacturers in their own States. Recent reports from the analytical departments of various States show that notwithstanding the agitation for pure food there has been little falling off in adulteration. Arkansas reports that out of 354 samples of various products nearly one-half were adulterated or sophisticated. Other States, such as Minnesota and Illinois, report from 33 to 40 per cent of food products dangerously adulterated or so far sophisticated that the labels give little idea of the contents of the packages.

THE DIAGNOSTIC SIGNIFICANCE OF HIGH ARTERIAL PRESSURE.

More exact methods of observation are to be desired in medicine, but the term exact has a relative significance. If a method is so troublesome that it involves the use of instruments which are themselves difficult of application, or the use of which is liable to error in inexperienced hands, it will prove of practically little value. Laboratory methods are usually classed among the exact methods of clinical procedure, but it is to be remembered that the interpretation of laboratory findings is based upon the same analysis of clinical facts that must always be employed at the bedside. A reliance upon laboratory methods to the exclusion of trained bedside observation may lead to an erroneous conclusion. One accurate clinical method that has practically displaced other methods is the clinical thermometer. Formerly physicians relied on the apparent temperature of the patient's skin as measured by the hand. Another general symptom which is of considerable importance is the estimation of arterial pressure. If it is too high the consequences are serious, if too low it may call for the most energetic treatment. Physicians have long been in the habit of estimating blood-pressure by the character of the pulse—the *tactus eruditus*. T. C. Janeway before a recent meeting of the New York Academy of Medicine discussed the value of the accurate method of estimating vascular pressure. He made a series of observations to test the value of the finger in estimating blood-pressure. In a number of cases the high arterial pressure could be determined and approximately estimated by the finger, but in others in which the pressure was high the condition was not recognized. The normal pressure necessary to obliterate the radial pulse with the patient at rest and a band encircling the arm having a width of 12 centimeters varies from 145 to 166 millimeters of mercury. Above the latter figure arterial pressure may be said to be abnormal. Pressures from 160 to 200 millimeters are very common in chronic nephritis, but in a few it can be clearly excluded. In 130 cases in which the systolic pressure reached 200 millimeters and above, 81 per cent had chronic nephritis, 6 per cent were doubtful, and there was no evidence of nephritis in 13 per cent. Ten or 15 per cent of the whole number, in whom there existed extremely high blood-pressure with cardiac hypertrophy, arterial changes, and other symptoms commonly associated with Bright's disease, presented no lesion of the kidneys. Dr. Janeway's results clearly point to the importance of estimating the vascular pressure by instrumental means.

SAHLI'S METHOD OF TESTING GASTRIC CONTENTS WITHOUT THE PASSAGE OF THE STOMACH-TUBE.

There is considerable discomfort attending the passage of a stomach-tube. Especially is this noticeable the first time that it is employed, before the patient has become accustomed to it. The ordinary Boas test breakfast is believed by many to be insufficient to bring out the full digestive capacity of the stomach. The microscopic and chemical examination of the recovered contents often throws valuable light on intragastric conditions, but it is doubtful if laboratory methods have been as satisfactory in this field of diagnosis as in some others. Such a thorough clinician as Sahli claims that in a large number of instances the passage of the stomach-tube in gastric disorders is not necessary. The same results can be reached by the ordinary methods of investigation, such as palpation, percussion, and by testing the motility of the stomach and its digestive power by the action it has upon raw connective tissue. He employs for this purpose methylene blue enclosed in an insoluble

membrane which is tied by a raw catgut thread. This is swallowed immediately after a full meal. If the digestive juices are acting efficiently the thread is dissolved and the methylene blue is released and absorbed. Frequent testing of the urine soon shows the blue color, providing the stomach is active. It shows the presence of free hydrochloric acid in the stomach and demonstrates any insufficiency in the secretory or motor function. Kühn (*Münchener med. Woch.,* December, 1905) has made a careful study of Sahli's method, controlling it by test breakfasts and the removal of the gastric contents in the usual way. It was found to be rather more exact than the usual method of recovering the gastric contents. The deficiencies of the latter were attributed largely to the limited test meal employed. Kühn is of the opinion that Sahli's method is more simple and accurate.

TESTEVIN'S REACTION.

Attention has been frequently called in these pages to the value of albumose in the diagnosis of focal suppurations. Like most tests of the sort the findings are not conclusive, a positive reaction being more valuable than the negative. The reaction for albumose is almost as valuable from a clinical standpoint as the leucocyte count; it is far simpler in its application. The simple and easily applied tests are the ones to which the attention of the profession should be especially directed. One that is deserving of more attention than has been accorded to it is Testevin's reaction, which apparently occurs under fixed conditions, and may be of value in the prognosis of diphtheria, typhoid, malaria, meningitis, and other infective conditions. It is apparently never present in healthy subjects, but varies in the infectious maladies named according to circumstances which have not been definitely determined. The reaction is obtained in the urine by adding to the urine, which has previously been deprived of its coagulable albumin by heat, an equal quantity of ether. The mixture is then shaken and forms an emulsion above the urine having the consistence of collodion, providing the reaction is present. It is apparently dependent upon the presence of some proteid not thrown down by heat, probably belonging to the peptone group.

THE OPEN-AIR TREATMENT OF TUBERCULOUS MONKEYS.

A high death-rate from tuberculosis among monkeys in confinement has been an accepted condition by keepers of zoölogical gardens for years. The monkey houses were always artificially heated in the winter, in this way supposedly imitating the atmosphere of the tropics. The zoölogical collection in Lincoln Park, Chicago, had about fifty monkeys. The average life of the monkey varied from seven to twelve months, in some cases death taking place in a few weeks from a very rapid form of tuberculosis. Three years ago a change was instituted. The monkey house was not allowed to have a temperature above 50°, and it communicated directly with the open air, and the monkeys are allowed out-of-doors all winter long. They are frequently to be seen sitting on little piles of snow and otherwise enjoying themselves in an atmosphere which is so foreign to their normal habitat. This change in the environment of the monkey has resulted in extinguishing tuberculosis from this particular group. Only three monkeys have died in the last year—two of them from traumatic causes, both fractures of the skull due to falls, and another from some internal disorder not connected with tuberculous infection. No more conclusive experiment could have ever been made showing the value of the open-air treatment of tuberculosis.

B. J. C. D.

ORIGINAL ARTICLES.

THE TREATMENT OF COMPOUND FRACTURES.[1]

BY EDWARD H. OCHSNER, B.S., M.D.,
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In order to get a clear understanding of the subject at hand, it will be necessary to recall two ordinary text-book definitions. A fracture is a loss of continuity of bone, however produced. A compound fracture is one in which there is a wound through the soft tissues, including the skin, and extending from the bone to the surface. The wound in the soft tissues may be caused either by the bone perforating from within outward or by almost any external force. A compound fracture may involve any bone of the skeleton and is always an injury of considerable moment, and may be very serious.

In order that our discussion may follow a logical sequence, let us consider for a moment the question of "first aid" in this class of injuries. To be more explicit, what shall we do and what shall we not do if we are called to such a patient in the street, in the factory, or in the mine?

The clothing should be cut open with a knife or shears, so that it may be readily removed. A piece of sterile gauze, or if this is not at hand, a freshly laundried towel, pillow-case, or sheet is wrapped about the injured member and a bandage snugly applied. If the hemorrhage is severe enough to continue in spite of this, an Esmarch constrictor may be required. The extremity is now placed in a pillow, blanket, or board splint, and the patient is transported to the home, physician's office, or hospital for the first dressing.

Possibly it would be better to emphasize the things which should not be done. If it can possibly be avoided, the patient should never be transported any considerable distance with the soiled clothing rubbing against the wound, or with the injured extremity dangling at the side. Above all, the injured part should not be handled roughly, and the wound should not be manipulated or probed.

The first question that has to be decided is, can the extremity be saved or will it require amputation? This question I would answer by saying that so long as the force which has caused the fracture has not cut off all of the principal arteries supplying the part, a primary amputation is never justifiable, and with proper treatment the extremity can nearly always be saved. I have never primarily amputated an extremity when there was any arterial circulation to speak of, and I need but briefly cite a case as one of the many instances where an apparently hopelessly injured extremity was saved to the patient.

A young man was brought to the hospital in a police ambulance after having his forearm run over by four wheels of a street-car. The patient was put to sleep, and on examination the following condition was found: The forearm was stripped of fully three-fourths of its skin covering, the radius had a compound fracture at the junction of the upper and middle thirds, and another at the junction of the middle and lower thirds; the muscles were so separated by the force that they looked almost like an anatomical dissection, and the radial vein

[1]Address delivered at the opening of the Piqua City Hospital, at Piqua, Ohio, Dec. 7, 1905.

and artery were cut across. In spite of this injury the arm was ultimately saved, and in a few months regained nearly all of its functions.

One cannot easily be too conservative in this matter. If the following points which I wish to make are carried out carefully, one has practically nothing to lose by conservatism and often much to gain, for nature has wonderful reparative power, especially in the young, and many times almost completely severed extremities will heal on, so to speak.

The next point of importance is that of rendering the area as nearly sterile as possible. If the fracture involves one of the large bones, a general anesthetic should always be insisted upon, because with the patient asleep the disinfection can be much more thorough. I have always adopted the following procedure: Cover the wound with a piece of sterile gauze in order to prevent washing the dirt from the surrounding skin into the wound, then scrub the whole extremity thoroughly with green soap, water, and brush, and rinse it off with sterile water. After this has been thoroughly done the wound itself is cleaned in the same manner. In order to do this satisfactorily, many succeeding basins or pitchers of boiled water may be required. The whole limb including the wound is carefully washed with ether, the wound thoroughly cleansed with turpentine, swabbed out with tincture of iodine, and finally washed out with alcohol.

For the purpose of removing grease and grime there is nothing quite so effective as turpentine, besides being one of our best antiseptics. Tincture of iodine I have always used because I know of no other so slightly toxic antiseptic whose antiseptic qualities cover so large a variety of pathogenic bacteria. Tincture of iodine also serves the useful purpose of searing over the wound surface. Many of these wounds cannot be rendered perfectly sterile by any means at our command, and unless this agent is employed the smallest infected area may serve as a focus for infecting the whole wound in a very short time. If tincture of iodine is properly applied it will close the cut ends of all veins and all lymphatics, including the tendon sheaths and bursæ, and so completely sear over all raw surfaces as to greatly limit the spread of the infection. It will also inhibit the growth of bacteria and prevent their rapid multiplication by rendering the wound dry, thus decreasing the amount of available pabulum.

Tincture of iodine is also very useful in destroying the much-dreaded tetanus bacillus, though for this purpose it is no longer so essential as it formerly was, as we now have an excellent preventive in antitetanus serum. For the past three years I have used an immunizing dose of antitetanus serum at the time of the first dressing in all cases of compound fracture in which dirt and grime in considerable quantities had gained entrance to the wound, and in no case did tetanus subsequently develop.

A very interesting case occurred in my brother's service at St. Mary's Hospital three years ago. A lad eight years of age was brought to the hospital with a compound comminuted fracture of the left leg. The fracture was treated by the method above outlined, but the immunizing dose of antitetanus serum was not given until the following morning. Everything progressed nicely until the twelfth day, when he developed unmistakable signs of tetanus, namely, trismus and opisthotonos. These, however, subsided in forty-eight hours and the patient made an uneventful recovery. This case, more than any other, convinced me of the prophylactic value of antitetanus serum.

If my memory serves me correctly, the only deaths from compound fracture that I have ever had were due either to primary shock or to tetanus—the latter before the introduction

of antitetanus serum. By carefully and conscientiously following the above routine in every case I have never had a fatal or serious septic infection complicating a compound fracture, a fair proof, I believe, that this danger, even if it cannot be entirely eliminated, can be reduced to a minimum.

If a large quantity of street or garden dirt has been rubbed into the wound, it is sometimes necessary to trim off the lacerated skin edges with a sharp knife, and even to cut off small particles of muscle and fascia, in order to satisfactorily cleanse the part, and in order to get at pockets containing dirt it is sometimes necessary to enlarge the wound in various directions.

If a compound fracture involves a phalanx and a general anesthetic is contraindicated, one can make the wound satisfactorily aseptic by the following method: The extremity may be immersed from two to three minutes in a two-per-cent warm carbolic acid solution. At the end of this time it will be quite thoroughly anesthetized, and if one will proceed expeditiously the method above outlined can be carried through without undue suffering. An anesthesia from dilute carbolic acid usually lasts only ten minutes, and is followed by hyperesthesia, hence the necessity of some haste. I have found this method very useful in several compound fractures of the phalanges, and in numerous superficial wounds of the extremities.

After the wound has been rendered thoroughly clean, it is well to inspect it to determine the exact condition of the fracture, to carefully remove tendons and nerves, fascia, and pieces of muscle from between the ends of the bone, to remove detached spicules of bone, to ligate ruptured vessels, to determine how much one will do in the way of repairing severed muscles, fascia, tendons, and nerves, and how to drain.

In reference to the reuniting of torn tendons and nerves, I would say that if the soft tissues have been badly lacerated, if dirt and grime have entered the wound in considerable quantity, the less plastic work one attempts at the primary dressing the greater percentage of good results one will have. In such cases one's entire efforts should be directed toward saving the life and limb of the patient and to get good bony apposition, and to leave the suturing of the tendons and the nerves to a subsequent plastic operation when the wound has been entirely healed for some time.

I am convinced that an attempt to do too much at the time of the first dressing often necessitates a subsequent amputation. Such plastic work not only increases the primary shock very considerably, but it also increases the danger from sepsis, and often interferes with the circulation of the extremity distal to the point of the wound and fracture.

I can possibly make this point clearer by briefly citing the case of a young man who came under my care at St. Mary's Hospital about three years ago. The patient was a paper-cutter and got both of his hands under the knife, so that the left forearm was entirely cut off about one inch proximal to the distal end of the radius and ulna. The right forearm was almost completely cut off, the knife having severed both the radius and ulna, so that the hand was dangling at the side with the soft tissue joining it to the forearm not exceeding the thickness of the index-finger. The patient begged so piteously before being anesthetized to have me try to save his hand that I promised to make an attempt. I disinfected it thoroughly, sewed it in place by a few silkworm-gut stitches, and awaited results. To my great surprise only the thumb and index-finger became gangrenous, requiring their removal a few weeks later. After the wound had entirely healed we united the tendons and

nerves, and the patient has regained sufficient use of what remains of his hand to be able to write and do various other things with it.

The only way in which I can explain the result is that there must have been a high division of the ulnar artery, for I distinctly remember ligating both the ulnar and radial arteries. I am sure that if in the above case I had made any attempt to find the nerves and retracted tendons the little circulation with which the hand was supplied would have been so damaged as to require a subsequent amputation.

The question whether the bone should be sutured or wired at the time of the primary dressing is often asked. I would say "No," most emphatically. By applying the proper retention apparatus, good bony apposition can be secured in almost every case without it, hence it is useless; and as all useless things in surgery are bad, it should certainly not be done in those cases in which good apposition can be secured without. Even where good apposition cannot be secured without it, it is better to allow the wound to heal first and subsequently do a bone suture operation. The great objection to suturing or wiring bone at the first dressing is the fact that it almost invariably causes more or less bone necrosis. This objection does not hold if one can bring the fractured ends together by passing the sutures through the fascial or tendinous covering of the bone, as in fractures of the patella.

We all know how long it takes for a piece of necrotic bone to separate. In some dog experiments several years ago I found that if the wound did not heal by primary union a small bobbin-like sequestrum would subsequently be exfoliated from each drill point. The same phenomenon I have several times seen after the use of the Parkhill clamp. This delays the first healing many months, and sometimes requires a subsequent operation for the removal of these sequestra.

The next question that has to be decided is usually the question of drainage, and with it the question of how much of the wound it is best to close. Of course, no hard and fast rule can be laid down, but I am of the opinion that the tendency is to close too much of the wound at the primary dressing. I am sure that it is much safer to err on the side of too little closure of the skin wound, because any defect can be easily and quickly closed later by Thiersch skin grafts, when all danger of sepsis has passed. Even wounds caused by the perforation of the bone will do quite as well if not sutured.

In a thoroughly drained wound severe septic intoxication is very rare, as the tendency of the lymph is to continually wash out the septic material, thus giving the organism a chance to protect itself by a wall of leucocytes. If the drainage is insufficient, the pathogenic bacteria and their toxins are constantly being forced into the lymph and blood circulation, the leucocyte barriers are again and again broken down, until the resisting power of the patient is finally overcome.

The form and kind of drainage employed will depend upon the nature of the wound. On the whole I believe that split rubber tubes or cigarette drains are much to be preferred to the old-fashioned gauze drainage so much in vogue some years ago. It is all-important to secure thorough drainage the first few days until the leucocyte barrier is established. Gauze drainage is very apt to cause retention in pockets at various points, and thus defeat one of its most important objects.

In compound fractures of the skull with laceration of the dura as a complication it is very important to close the primary wound after excising the bruised, mashed, and infected skin, bone, and dural margins, and to make a new drainage opening one or two inches away from the point of the compound fracture. This pro-

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cedure will prevent many cases of hernia cerebri that otherwise are almost sure to occur in case every particle of infected material has not been removed during the disinfection.

There is one other reason, besides the possibility of sepsis, why primary drainage should be very thorough, and I am afraid it is a consideration which is too often lost sight of. I refer to fermentation fever, or so-called primary wound fever, which I am sure is a common cause of death in severe compound fractures in that it causes secondary shock. We all like to see a reasonable amount of fermentation fever in compound fractures, as it is an evidence of the resisting power of the patient, but fermentation fever can be so excessive as to actually cause death. This excessive fermentation fever I am sure can be prevented in many cases if the wounded tissues are not unnecessarily manipulated, if at the primary dressing too great an attempt is not made to repair the lacerated tissues, and if the wound is left wide open and thoroughly drained.

The term thorough drainage may mean so many different things to different surgeons that I would like to explain what I mean by it in these cases. The majority of compound fractures that have come under my care left the operating table after their primary dressing with larger skin wounds than they had when they went upon the operating table. The larger my experience has gotten, the fewer stitches I have applied in these cases, and the more pockets I have obliterated by cutting through the overlying skin.

We now come to the question of immobilization, and this is the problem which requires the greatest amount of ingenuity, because no text-book or even treatise or system can be so complete as to give directions in regard to the kind of splint or immobilizing apparatus which should be used in every conceivable contingency. No two cases are alike, and the different complications and consequent varying requirements are practically innumerable.

As in simple fractures, our aim must be to get the fractured ends in proper relation to each other, and to hold them in this position until union has taken place; in compound fractures we must in addition secure opportunity for drainage. All this must be accomplished without undue discomfort to the patient. In compound fractures this is usually difficult and sometimes impossible, but with good judgment and perseverance it can usually be satisfactorily solved.

To enumerate and describe the different kinds of material and splints that have been used for compound fractures would require pages and pages, and is beyond our purpose and time limit. Any splint which fulfils the above requirements, no matter what it is made of, or how it is applied, is the one to use in the individual case. To get the ends in apposition and to hold them there is usually the less difficult part of the problem, but to so apply the splint that the wound can be inspected and dressed without disturbing the retention apparatus, to have it so arranged that the wound secretions can find exit without soiling the permanent dressings, is often a very difficult matter, and yet the more perfectly we solve this problem the more satisfactory our results will be. If we can so plan our method of treatment that the splint which we apply at the primary dressing will not have to be disturbed until bony union has taken place, we will have done much for the patient. The frequent changing of the splint in compound fractures has many and serious objections. In the first place, it is apt to disarrange the proper apposition, and as a result one of two things is likely to happen: either there will be so much displacement as to result in non-union, or if the displacement is not so great an excessive amount of callus will develop, which is apt to

cause inclusion of nerve trunks and interference with circulation. In the second place it causes the patient a great deal of suffering. This sometimes saps the vitality of the patient to such an extent that he is unable to withstand the concomitant sepsis. It causes an additional trauma to the already devitalized tissues, and consequently facilitates absorption of septic material. In a robust individual these things may not make any great difference as to the ultimate result, but in a very delicate individual, or one whose strength has been greatly impaired by the accident, it may be just the one thing that will be too much for the patient to bear. It is not an uncommon thing to see one of these patients come from the dressing-room utterly exhausted, and it is surely well worth our while to try to eliminate this evil whenever we possibly can.

In compound fractures of the lower two-thirds of the femur, in which plaster-of-Paris dressing will often not hold the fragments in good apposition, I have found the pneumatic splint quite satisfactory. In other compound fractures in which a fenestrated plaster-of-Paris dressing can be employed I have found the method recommended by Dr. Hugh Crouse, of El Paso, Texas, very useful. It consists of the following procedure: When the wound has been properly disinfected and the fracture ends are in good apposition, a small sterile dressing covering the wound and the surrounding skin for an inch or two in every direction is applied. Then the remaining portion of the limb that it is intended to encase in the plaster-of-Paris splint is wrapped in cotton and covered by a bandage and the plaster dressing applied in the usual manner, strengthening it as required with wood, steel, or wire strips. The fenestrum is then made, and the small dressing covering the wound is removed. A piece of sterile gauze of several thicknesses is now cut so as to overlap the wound edges a little, the exposed skin is carefully dried with ether and sterile gauze, and then the preparation, which I will describe directly, is carefully packed between the limb and the cast.

The preparation or mixture is secured by dissolving small pieces of Sampson's or any other good dental crown rubber in commercial chloroform, using sufficient of the rubber to make a semifluid, mucilaginous paste. Into this small pieces of lamb's wool are cut, and it is now applied as above directed. In this way an impervious dam is constructed which thoroughly protects the cast against any soiling.

I have recently had a young man under my care who came to me with a secondarily infected tubercular ankle. After the resection it became necessary to institute through-and-through drainage. I applied a plaster-of-Paris cast with two fenestræ. The cast was protected in this manner, and although there was considerable discharge at first, and although the patient was allowed to walk on the foot as much as he wished, the cast was found perfectly sweet and clean on its removal eight weeks after its application.

I now have under my care a man suffering from a compound fracture of the lower end of both tibia and fibula with involvement of the ankle-joint, who is walking on such a splint. The wound can be dressed when required, and the cast can be left in place as long as desired without its being soiled. I am sure that the use of this preparation is the most important thing I have learned in the treatment of compound fractures in the last ten years.

Much has been said and written about the treatment of fractures involving joints. If the joint involvement is slight, and the wound has not been soiled, the treatment above outlined may suffice. If more extensive and more soiled, but involving a joint in which there are not too many recesses and synovial pockets, the joint may be carefully swabbed out with 95

per cent carbolic acid, followed in two minutes by thorough irrigation with 95-per-cent alcohol. If very extensive and the wound is much soiled, the safest procedure is to excise all the synovial membranes and to ablate all the articular cartilages before proceeding with the final disinfection and splinting. To be sure this will result in an ankylosis, but if reserved for cases in which ankylosis would be sure to result from the infection itself this treatment will save many limbs and lives, for no infection, not even that of the peritoneum, is more fatal than a severe infection of one of the larger joints.

There has also been much discussion as to what the subsequent treatment of such joint fractures should be. Where ablation of the cartilages is necessary, and where ankylosis consequently is to be expected, I think all agree that the limb should be placed in the position in which it will be most useful, and kept in a suitable splint until firm union has taken place. In the after-treatment of the less severe joint fractures there is, however, a great diversity of opinion. Many teachers and authors advocate the removal of the splint at the earliest possible moment, namely, just as soon as this can be done without too much risk of refracture. Then they advise active and passive motion, massage, hydrotherapy, etc. On the whole, I think there is a much better and easier way to treat these cases. I believe it is best to splint the limb in the position in which it will be most useful to the patient should ankylosis occur, and to leave it in this position until the wounds in the bone, joint, and soft parts, including the skin, have completely healed, and not to begin active and passive motion until all reaction has subsided.

We know from experience that there are two periods when the tendency to formation of adhesions can be most successfully combated. The first period covers the first three days; the second period begins when the connective tissue contractions begin to obliterate the vessels, thus cutting off the nutrition of the adhesions. This latter usually sets in about three months from the date of the injury and continues for about nine months, when the process of cicatricial contraction is usually completed. Between three days and three months after the injury is the period of active connective tissue formation, and nothing favors this more than massage and active and passive motion. From the very nature of things it is self-evident that nothing can be done to prevent adhesions during the first three days, and as the usual methods employed favor connective-tissue formation instead of connective-tissue absorption, until at least three months after the injury, it should be plain that rest secured by proper immobilization is the most potent therapeutic agent at our command during the first three or four months. I have never seen ankylosis which could fairly be ascribed to prolonged immobilization, while I feel sure that I have seen a number of cases in which too early manipulation has favored partial or complete ankylosis.

If at the end of four months there is limitation of motion, active motion should be prescribed. The directions as to the kind of active motion should be definite and should be carefully chosen by the attending surgeon, so as to meet the requirements of the case at hand. With children it is well to have playthings so selected, or if necessary so constructed, as to compel them to unconsciously use the member in question. For instance, with limitation of motion of the knee a rather large tricycle with only one pedal, and that on the side corresponding to that of the affected limb, often answers the purpose. In partial ankylosis of the elbow a wheelbarrow and a sand-pile will sometimes work wonders. These methods are not only much more comfortable and effective but also

very much less expensive than all forms of passive motion. If passive motion is indicated, as it sometimes is, that secured by the Zander or Hertz orthopedic machines is, as a general rule, much to be preferred to manual passive motion.

If moderately firm, fibrous ankylosis exists, forcible breaking up of the adhesions followed by suitable active and passive motion is indicated, while if the ankylosis is due to a spicule or bridge of bone, it is necessary to chisel off the bony obstruction. If the fibrous adhesions are so firm or so extensive and unyielding that they cannot be broken up by force, the operation of turning in a fascial flap between the ends of the bone, as advised by Murphy, should be resorted to. In complete ankylosis it is useless to persist in torturing the patient with passive motion if after a few weeks' trial no improvement can be noted. In that event no time should be lost in resorting to one or the other of the procedures above outlined.

I am very glad to have had the opportunity to address this audience on this subject. There is no branch of surgery that is more interesting to me, and I know of none in the practice of which versatility, ingenuity, conservatism, quick decision, and good judgment are more essential to the securing of good results.

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REMARKS UPON CERTAIN STATES OF VASCULAR SPASM AND FIBROSIS.[1]

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I wish to discuss in this paper certain conditions of the circulatory apparatus which, I think, receive too little attention from the profession and from the text-books and manuals from which we are wont to refresh our memories. The cases to which I refer represent conditions which are certain to affect a fairly large proportion of all the men in this room if they live beyond middle life, for these states are, to a certain extent, coincident with the onset of old age, and old age comes to some at fifty and to others at eighty. Furthermore, these conditions are peculiarly prone to arise in four pursuits of life, namely, in the banker or broker, the ironmaster, the lawyer, and the physician. This susceptibility depends upon the fact that they are subjected to great nervous and mental strain, and some of them are individuals who partake liberally and constantly of alcohol and rich food, the latter often being eaten when the system is ill prepared to deal with it adequately. The condition is met with not rarely in other persons, but it is in these four classes that it occurs oftenest. In most of them the vessels, the kidneys, and the heart form a triad of morbid change, but in some the heart and kidneys primarily escape, the vascular lesion being the chief change from the normal. With the state characterized by disease of the triad just named we are all familiar, and it is often difficult to determine which one of the triad first suffered, for when first seen by the physician all three are so equally affected that the process may be said to be coincident. With this type it is not my intention to deal, save to point out that they differ materially in their clinical history from the cases I shall describe, more particularly as to the duration of life, which is nearly always short.

I wish to speak of the class of cases in which the vascular symptoms so largely predominate that there can be no reasonable doubt that the lesions are primarily in the vessels rather than in the kidneys. Further, I intend to discuss but

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one type of these cases, namely, those in which there is an immoderate degree of arterial tension without any renal lesions which are demonstrable by the ordinary symptoms or by urinary analysis. In these cases the state of the blood-vessels is nearly always the same, although it differs in degree, and the heart may secondarily present signs of hypertrophy, or feebleness from fatigue or degeneration.

The cases on which these views here discussed are based have been met with during a space of several years, and some of them have been studied with my friend, Dr. de Schweinitz, who has examined them from the standpoint of the ophthalmologist, while I have seen them through the glasses of the medical clinician. In other instances the cases have been studied with the aid of Dr. Stanton, whose work with the sphygmomanometer has so well qualified him to study the arterial tension as we meet with it at the bedside or in the consulting-room.

To express the matter briefly, we meet with three types of cases of high arterial tension: (1) Those in which persistently high tension is a result of spasm due to prolonged nervous stress combined with certain abuses as to habits of life, food, and drink. (2) Those in which tension is high because in addition to spasm there is gradually developing, or has already developed, fibroid change in the vessels. (3) Cases in which, after a prolonged period of high tension, persistent low tension more or less suddenly develops in which the arteries are relaxed and distended, so that they resemble veins to some degree in their caliber and compressibility.

The first class, in which the tension is chiefly due to spasm of the vessels, is met with in middle-aged men who lead lives calculated to throw great strain upon the vascular system, as brokers and physicians. In these cases fatigue is often overcome by stimulants, and the physician does not see the case until an attempt to improve the health by violent exercise causes dyspnea or cardiac distress. These cases usually show only moderate degrees of abnormally high pressure, rarely exceeding 150 or 160 systolic. Auscultation reveals an accentuated second sound, an accentuated first sound, and some hypertrophy, as evidenced by a forcible apex beat. Occasionally a beat of the heart is missed, as if the heart was tired or discouraged at the perpetual effort against an abnormal *vis a fronte*. If these cases will rest from severe exercise and business stress, and take the nitrites, with no stimulants, they speedily improve and often get back to a normal state. The tension is due to spasm of the vessels and not to well-developed fibroid change.

The second type, in which there is both spasm and fibroid change, present different symptoms according to the degree of these two abnormal states, and they respond to treatment readily if the spasm factor is uppermost, and but slowly, or not at all, if the fibroid change is most marked.

The third type is represented in the following cases:

A man of 57 years, an ironmaster by occupation, who had been a constant user of whisky in moderate quantities every day for many years, presented himself in my consulting-room in April, 1905, with a history that he had been for several months suffering from "asthmatic attacks." These attacks were not true asthma, but of the nature of cardiac oppression with dyspnea. He was lean and showed evidences of nervous stress. His urine had contained albumin, but did not when he came under my care, and has not since. A physical examination revealed a very sharply accentuated aortic second sound and very tense vessels, so tense that the radials could not be closed by pressure with the fingers. The apex beat was very forcible, but not diffuse. There was marked cardiac hypertrophy. An estimation of his pres-

sure at this time with the sphygmomanometer showed that his high, or systolic, pressure equaled 225 millimeters of mercury, with a low pressure of 155. At times the high pressure would rise with nervous excitement to the remarkable height of 255 millimeters, showing not only vascular spasm but the presence of a powerful left ventricle. He was placed in bed, given a rest-cure with massage and alterative treatment, and in two weeks the pressure was reduced to 200 high and 130 low. This was the lowest point to which I could reduce the pressure, even when large doses of nitroglycerin, sufficient in size to make his head ache, were given. He returned home very much better as to his own sense of health, but came back in six weeks with a pressure of 225 high and 145 low, with some beats at 215 high. A month later with little treatment he again returned with a pressure of from 230 to 205 and a low pressure of 140. He could not remain for active treatment, and during the summer had several attacks of cardiac asthma. In last October he returned for further examination. At this time it was evident that his heart and large vessels had yielded to the great strain thrown upon them. The first sound was not so good as before, and the apex beat was much more diffuse. The tension was noticeably lower, and the sphygmomanometer showed a pressure of 190 high and 135 low. Under the free use of nitroglycerin and rest in bed it fell in forty-eight hours to 170, with occasional beats at 190 and a low pressure of 130 to 135.

There are several points in connection with this case which are of interest aside from the fact that his pressure was as high as 225 millimeters of Hg when his heart was equal to its work. First, the value of rest in reducing pressure; second, the fact that as the high pressure fell the low pressure remained about constant, varying from 130 to 145; or, in other words, treatment was able to lower his systolic pressure from 40 to 50 points, but did not alter his diastolic pressure more than 10 or 15 points. When, however, the heart began to fail under the strain, the systolic pressure fell to 190 under excitement, and 170 when at rest. Again, tracings at this time showed that the heart action as to rhythm and force was impaired and the case illustrates the type already named in which the pressure is not due to spasm alone, but to fixation of the smaller vessel walls, by fibrosis, so that vascular relaxants cannot do much good. When the heart was given another period of rest, with a little digitalis to support it, and nitroglycerin was freely used to prevent rise of tension from spasm due to digitalis, it was found possible to greatly improve the first sound, to diminish the signs of cardiac dilatation, and to give the patient much cardiac comfort. Finally, this case is of great interest in another respect, namely, that it illustrates a type in which nitroglycerin, in any dose which is compatible with the comfort of the patient, fails to lower tension because the change in the peripheral vessels is essentially one of fixation by fibrosis and not by spasm. This is an important therapeutic point, showing that the physician can expect nitroglycerin only to reduce the part of the hypertension which is due to spasm and not that part due to fibroid change. The latter state is largely beyond the influence of medicinal agents unless it be the iodides. On the other hand, the combined effect of rest, massage, and iodides will often, even when fibrosis is well developed, not only produce excellent results, in that the state of a tired heart is improved, but also result in a marked diminution of arterial tension partly by a cardiac and partly by a vascular influence. Thus I have in another case for three consecutive years been able by such a course of treatment to so lower arterial pressure that the anginoid attacks due to spasm and fibrosis have been prevented from occurring for months at

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a time, a fall in both the systolic and diastolic pressure, amounting to 15 mm. of Hg, being maintained for months by treatment by drugs. This case is also an excellent example of the manner in which the heart may escape serious lesions even when the vessels are gravely affected, for although he has had an aortic systolic murmur due to aortitis for several years and a systolic pressure of 170 or over, he has recently passed through an operation for purulent peritonitis due to appendicitis, during which a German surgeon, called in an emergency, and ignorant of his vascular state, gave him chloroform for one and a half hours. Chloroform, because of its depressant effect upon blood-pressure, was perhaps safer than ether, but I should have considered that the heart was in too serious a state to permit of the use of such a cardiac depressant as the first named drug. In other words, if this case had been one in which the heart, kidneys, and vessels were all involved together in the sclerotic change, he probably would not have survived the operation.

Another case which has been under my care for a very much longer time also illustrates the fact that the most remarkable changes may take place in the vessels, without the heart undergoing fatal change, provided only that by some good fortune the coronary vessels and communicating fibers of his heart suffer slightly.

In December, 1900, I first saw Mr. H., a banker from the western part of this State. At that time Dr. de Schweinitz stated that he presented typical Gunn's vessels. There was an extraordinary degree of arterial pressure, which made it impossible to close the radials by pressure with the fingers. As the sphygmomanometer was then little used in medicine, no records were made. At his second left costal cartilage an aortic systolic mumur, chiefly heard on expiration, was noticed. It was undoubtedly not valvular in origin. The urine contained a very faint trace of albumin. His heart was greatly hypertrophied and dilated, resembling the "ox heart" of aortic regurgitation, but there was not then, nor has there been since, any sign of that valvular lesion. He was given gradually ascending doses of nitroglycerin to lower tension and aconite to diminish the excessive cardiac impulse, which was so great that it forced my head to and fro whenever I listened to his heart. Partly for his general vascular state, but particularly because of the retinal hemorrhages which he presented, he was also given full doses of sodium iodide. Under this treatment at the end of six months the aortic murmur had almost entirely disappeared, and the second sound was not nearly so accentuated. At the end of two years he was taking 10-100 of nitroglycerin and nearly a grain of the solid extract of aconite three times a day. He stated that he was feeling remarkably improved, but five months later he showed a most extraordinary degree of arterial tension, and a degree of cardiac hypertrophy which was also remarkable. The nitroglycerin was increased to 12-100 a day, and the iodide and aconite maintained. As after a few days these doses did no good, the nitroglycerin was increased to 8-50 a day, and soon after to 12-50 and then to 14-25. Finally, three years after treatment was begun, the dose amounted to 12-10 a day. Albuminuria varied in degree through these three years. Often it was absent, rarely it was marked, sometimes it was a mere trace. In March, 1903, his tension was not worse and his heart's action still forcible. At this time Dr. de Schweinitz wrote me as follows:

"Mr. H. certainly presents the most astonishing appearance of high tension. I do not know when I have seen such an outlining of the superficial vessels. Curiously enough, his eyes are not any worse than when I reported to

you last. There are a good many hemorrhages in the right or better eye, but not more than there were last spring. The left eye shows a most elaborate development of the so-called proliferating retinitis, which is a sequel of retinal hemorrhages."

Seven months later, in October, 1903, Dr. de Schweinitz wrote again:

"The vision of Mr. H.'s right eye is perfect, and the retina entirely clear of any hemorrhages or exudates, with the exception of one small spot in the lower portion of the retina, which has been there for a long time. The retinal circulation is good, considering all things. I do not mean that there is no compression by sclerotic arteries, but there is no excessive compression. The condition of the left eye remains about the same, the proliferating retinitis the result of the former hemorrhages not having increased. It is, however, in so far as its response to remedial agents is concerned, not to be influenced, as it represents a connective-tissue formation. I do not see any fresh hemorrhages. On the whole, I think the eye report is a satisfactory one and conforms to the improvement which I learn from you has taken place in the general condition, which I myself observe."

A year later, namely, in October, 1904, when he presented himself the picture had changed greatly, and he showed the signs of *ruptured compensation* not only as to his heart *but as to his large vessels,* a condition which I think deserves more attention than it receives. The area of cardiac dulness had greatly increased, and the apex beat was very diffuse and quite feeble. He felt weak, was easily exhausted, and seemed ill. His temporal arteries, which had heretofore been like whipcords, were now distended and looked like veins. They were soft and relaxed. At the apex of his heart a distinct systolic murmur, due to insufficiency at the mitral orifice, could be clearly heard. He was placed in bed and given a rest-cure with strychnine and cactus. The aconite and nitroglycerin were stopped, but the iodide was continued. A general fibroid change in all his joints was noticeable. His spine was stiff and curved, as in spondylitis rhizomelique. He improved greatly as to the tone of his vessels and his heart under this treatment, and returned home.

On his return in May, 1905, I had made the first estimation of his arterial tension. The high or systolic pressure was 180, the low 130, but the heart had apparently rallied to the strain a second time, and Dr. Stanton reported that he had never seen such extraordinary pulse waves; they amounted to 22 millimeters of mercury at a stroke. The large vessels were relaxed and distended, and the enormous pulse wave was clearly to be seen in them. In other words, the heart regained its power, the large vessels were relaxed, but the peripheral resistance and rigidity of the arterioles were great.

In October of this year the results with the sphygmomanometer were the same as to pressure, namely, 185 high to 135 or 140 millimeters low, but the heart was much more regular in its action and the individual pulse beats were more regular as to force. An examination of his vessels and of his tension revealed still more improvement during the present month.

There are many points of interest in this case, therapeutic, diagnostic, and prognostic. Therapeutically it is of interest because of the large doses of nitroglycerin which he took, over a grain a day, without any considerable symptoms, although they produced but little effect on tension, because the tension was due more to fibroid change than spasm; second, the fact that these full doses of nitroglycerin diminished sexual power, and caused a state of vesical feebleness so that it became difficult for him to hold and pass his water; and third, because his cardiac hypertrophy was so excessive that

large doses of aconite did not materially reduce his heart's action.

Pathologically the case is of interest because it manifested cardiac hypertrophy of an extraordinary degree to meet arterial stress. The coronary vessels must have largely escaped to permit of this hypertrophy. Again, a time came when compensation finally ruptured in both the heart and large vessels, all of which yielded to the strain, although the peripheral arterioles remained narrowed by reason of fibrosis. In other words, the interesting point appears that during excessive peripheral resistance the heart and the arteries first increased in power side by side, but finally the large vessels relaxed, or dilated because of fatigue, as did also the heart, which is after all only a specialized part of the vessels.

So far as I know this point as to the possibility of rupture of compensation in the muscular fibers of the larger blood-vessels is a new one.

Given a case of cardiovascular fibrosis of this sort, in which there were repeated hemorrhages into the retina in 1900, no one would have supposed that life would last for so long as five years. Indeed, a case was seen by Dr. de Schweinitz and myself a short time before which impressed upon us the grave omen of Gunn's vessels with retinal hemorrhages, for in this case, which presented far less degenerative change in the peripheral arteries, sudden death took place during sleep within a few weeks. This latter case presented the type in which the vascular lesions were less advanced than the changes in the heart, whereas the case I have just cited at length represented the type in which the heart escaped the touch of the arterial change, which was general throughout the system. In other words, the duration of life in these cases depends upon three important factors, namely, the escape of the heart muscle and its coronary vessels from the blight of degenerative change, the escape of the kidneys from fibroid change, and the escape of the cerebral vessels to such an extent that they can resist the pressure and so protect the patient from a fatal cerebral hemorrhage.

As illustrative of the prognostic value of Gunn's vessels and retinal hemorrhages I may quote some statistics collected for my book on the Practice of Medicine:

"Belt collected 419 cases, of which 72 per cent died within one year and 90 per cent of the remainder died within two years. The cases reported from Haab's practice by Possauer showed that none of the men applying to the clinic for treatment lived more than two years; of the women, 68 per cent died within the same period of time. Of private patients who could live comfortably, only 59 per cent of the men and 53 per cent of the women had died at the end of two years. Gruening collected 100 cases, none of which survived more than two years after retinal changes began, and Bull found that sixty-nine out of 103 cases died within two years. Of the remaining thirty-four, seventeen died after a longer period, and seventeen were alive at the time his paper was published. Harlan analyzed forty cases with the following results: Thirty-three ended fatally at various periods averaging four months; three lived a year after the discovery of retinal changes; three recovered, and one regained his eyesight, although the urine was albuminous at the end of two years. Miley traced forty-five cases, and found the average duration of life to be less than four months from the time eye changes were first observed. One of his patients lived eighteen months and two fourteen months, but all the others died within a year."

Some of these statistics have been adversely criticized, but they point a way toward prognosis even if they are partly incorrect. I believe that we cannot reach definite conclusions

as to the value of Gunn's vessels and hemorrhages into the retina until we have statistics as to the associated state of the kidneys. If these organs are normal or approximately so, the prognosis is much better, for obvious reasons, than if they are diseased, in which case a duration of life of a few months is probable.

Finally, the points I wish to emphasize are as follows:

1. In cases of high tension due to fibrosis the nitrites can be of but little value, and the iodides with rest and massage are needful.

2. Cases of *very* high tension are usually those in which the heart escapes sufficiently to help maintain the tension.

3. As fibrosis in the peripheral vessels increases, the muscles of the larger vessels undergo hypertrophy, as does that of the heart.

4. It is quite as possible for vascular compensatory hypertrophy to rupture as for the cardiac compensatory hypertrophy to do so.

5. This rupture of vascular hypertrophy often gives the heart a rest and permits it to recover from its fatigue, and so life is saved.

6. It is possible, if the peripheral fibrosis is arrested, for the vessels also to regain power and a general improvement to ensue.

7. The cardiac stimulants are not needed in these cases as much as rest and the skilful use of alteratives and vascular sedatives.

ARTERIOSCLEROSIS AS A GENERAL DISEASE.[1]

BY ALFRED STENGEL, M.D., PHILADELPHIA, PA.

It is noteworthy that there remains so much that is obscure and uncertain about arteriosclerosis when one considers the amount of investigation that has been devoted to it and the seemingly satisfactory conclusions that have been reached in certain directions. The recognition of arterial disease as a factor in certain organic conditions, such as cerebral hemorrhage, myocardial disease, focal necroses, gangrene, aneurism, and some other localized processes, seemed to have established a quite comprehensive understanding of the pathologic importance of the condition, until Gull and Sutton and Lancereaux showed the much broader relations of the condition and opened up a field for investigation both clinical and pathologic far more extensive and difficult. The conception of arteriosclerosis as a process of hardening of the vessels, which may or may not occasion serious embarrassment of the circulation and secondary results due to cardiac failure, thrombosis, embolism, or rupture of the vessels —this older conception is now completely out of date. A proper picture of the condition portrays a more general disturbance of the whole organism, a tendency to wide-spread degeneration of tissues, and in the early stages nutritional or metabolic disorders, in part the concomitants of the causal conditions, and in part the result of the initial stages of the arterial disease. To be a little more specific: it must be recognized that with advancing arteriosclerosis there is disturbance of organic functions not confined in a strict sense to the circulation, but involving digestion, renal action, various nervous mechanisms, perhaps also the hepatic processes and general metabolism. These are not definitely the results of mechanical disorders of circulation, and the moiety dependent upon the underlying causes of the disease cannot be surely distinguished from that which results from the arterial disease itself. I am

[1]Read before the Philadelphia County Medical Society, Dec. 30, 1905.

speaking now of early stages, and may illustrate by a striking case that came under my observation recently.

A gentleman, aged about 60 years, who had been accustomed for many years to a generous (that is, immoderate) life, who had consumed much alcohol, and who was manifestly gouty, first developed an obstinate form of eczema, then a dry pleurisy, later a dry pericarditis, and finally a condition in which loss of weight, loss of vitality, increasing pallor, disturbances of circulation, slight cardiac pain, dyspnea, and flatulent dyspepsia were conspicuous. At this time definite hardness of the peripheral vessels was discovered, and increasing circulatory disorder followed.

One might in such a case conceive of the pathologic process as simply a form of generalized gout affecting first the skin, next the pleura, then the pericardium, and finally the cardiovascular apparatus; but as the trouble advanced, the significance of the arterial element became more and more marked, and the separation of the rôle of the original cause from that of the secondary process became somewhat difficult, though it was evident that each bore a notable part. It is noteworthy that in this case a thoroughgoing regulation of the patient's life and a course of treatment at Nauheim apparently arrested both processes for a time. Up to the period at which this case had arrived there were no terminal changes in important organs, not even, as far as could be discovered, in the heart.

In the middle stages, however, of arteriosclerosis, wide-spread organic lesions do occur. The effects of coronary sclerosis in the heart muscle are well known; the frequency of renal sclerosis has been emphasized by Gull and Sutton and many others; the cerebral and even spinal results are familiar though only recently fully recognized; the lungs, the pancreas, the gastro-intestinal tract, and even the liver, so scantily supplied with arterial circulation, suffer degeneration and atrophic change. It is not my purpose to-night to discuss the relations of the arterial disease to any of these organic changes, nor to estimate the frequency of an arteriosclerotic origin of the organic changes in question. Those who are impressed with the importance of arteriosclerosis as a generalized disorder perhaps overestimate its part in the causation of such diseases, but the profession as a whole undoubtedly fixes its attention too closely upon the conspicuous manifestations presented by the organ that happens to be principally involved. It cannot have escaped the attention of any of us that chronic interstitial nephritis as an independent affection is less frequently discussed than formerly, though the opinion that this particular form of renal disease is nearly always a result of arteriosclerosis is possibly extreme. Doubtless there are occasional cases of primary chronic interstitial nephritis with secondary arteriosclerosis just as there are frequently cases of chronic diffuse nephritis with such a result. Somewhat similarly, chronic myocardial disease independent of valvular disease and arteriosclerosis is less frequently recognized than formerly.

In this second period of arteriosclerosis as in the first there is difficulty in recognizing the part of the arterial disease in the general condition, since the secondary organic disorders contribute a more or less indistinguishable portion of the clinical picture.

Finally, in the last phase, whatever the type of the case, increasing circulatory disturbances usually dominate the whole process. There are cases of purely renal or cerebral death, but as a rule, even when the type has been cerebral or renal, cardiac failure terminates the scene. It must not be forgotten, however, that in this final stage increasing susceptibility to infection

with decreased circulation may occasion terminal infections, especially pulmonary and peripheral. We may then recognize three stages of arteriosclerosis considered as a general disease:

1. A preliminary one, difficult of recognition in its beginnings and confusing to the clinician in his efforts to distinguish the part of the etiologic factors from that of the arterial disease in the symptom complex.

2. A middle period during which the arterial disease is easy to recognize, but in which secondary organic changes have a rôle of variable importance.

3. A final stage of failure of circulation, organic failure, and terminal infections.

The diagnosis of arteriosclerosis is usually established during the second period and rarely offers serious difficulty. Only when undue attention is given to some local disturbance, such as albuminuria, palpitation, or vertigo, or when the vascular disease is so uniformly distributed that it manifests itself only in a general failure of vitality, is the recognition of the disease likely to occasion confusion. In the final stages, too, though the form of local disease and the immediate occasion of the patient's failing health or taking off may be too much considered, the contributory influence of the hardened blood-vessels rarely escapes attention.

So much has been accomplished for the recognition of arteriosclerosis as a general disease and as the foundation for morbid processes of varied type. Only recently, however, has the campaign of investigation been extended to the earlier stages, the period when obscure and less certainly organic vascular conditions present themselves. I recognize the uncertainty of conclusions drawn from such pathologic and clinical investigations as have been made, but it cannot be denied that a variety of testimony justifies the tendency to regard beginning arteriosclerosis as a general cause for certain obscure forms of disease or disorders of health or vitality.

A clearer view of the conditions of this stage will be obtained after a brief survey of the pathologic features of the disease of the arteries and a reference to some of the etiologic factors. Arterial hardening is one of the factors in the pathology of senility, and a greater or less degree may be expected in every human being beyond the age of sixty. How much earlier such changes may occur depends upon various conditions of life. Undoubtedly in many the process begins quite early and progresses so regularly and slowly, and with so little disturbance of circulation or other functions, that it long remains unrecognized or even unrecognizable. Quite different from this normally progressive arterial disease is that which is met with in younger subjects. More conspicuous than any other difference is the tendency to restriction of the process to certain localities, or at all events to the greater involvement of certain vessels. In the senile form there is a more uniform process involving the vessels of the center and periphery more or less equally, and with this I believe there is a coincident involution of somewhat the same character involving the body as a whole. It would lead too far to discuss the reasons that seem to me to justify the view that the tissues generally are involved somewhat independently of the arterial narrowing and failing circulation, but I must at least refer to the fact that general sclerotic processes in the organs and their capsules and shriveling of the tissues are sometimes distinctly out of proportion to the arterial involvement. Whatever may prove to be the truth as to this view, there is no doubt that the symptoms of normal senile arteriosclerosis are strikingly scanty as compared with those encountered in cases of the presenile disease. It may

be said in answer that only the cases which proceed in a quiet progressive fashion are classified as normal senile type, but, on the other hand, we cannot but admit that the cases recognized early are those which are in a majority of instances likely to be attended with marked disturbance of health and with definite organic disease. I have come to the conclusion that the presenile cases are in the matter of their nature as well as their time of occurrence more distinctly pathologic; that by reason of their comparatively greater involvement of the arteries than the tissues as a whole they are more prone to cause notable functional disturbances, and for the same cause are more likely to run a rapid course.

There is still so much uncertainty as to the exact rôle of laborious work, alcohol, other intoxications, overfeeding, nerve strains, gout, primary renal disease, heredity, and infections in the causation of early arteriosclerosis that it is impossible to express certain convictions regarding the existence of a form of arterial disease due to such causes differing from the normal involutional type. But it is of interest to note in this connection how generally certain syphilitic diseases of the arteries are distinguished by pathologists from the ordinary arteriosclerosis, a distinction that until quite recently has been regarded as of doubtful significance.

The obscurity of the early changes in the blood-vessels and the uncertainty regarding the part of the vascular system first involved, the clinical difficulty of determining accurately the circulatory conditions of the early stages, and the want of reliable information as to the physical and chemic properties of the blood in the beginning stages, have thus far made the study of the origin of arteriosclerosis an unproductive one. Physiologists and clinicians have occupied themselves with determinations of blood-pressure, and various investigators insist that there is a preliminary stage of continued high blood-pressure. This has been attributed by some to spasm of the arterioles or contraction of the capillaries due to toxic or nervous influences, by others to some change in the viscosity of the blood causing obstruction of the circulation. The latter view rests upon hypothesis, pure and simple; the former is based upon observations which, with von Basch, I believe have often been conducted in cases of already established arteriosclerosis. Those who maintain either of these views contend for a prescleroticor a preorganic stage of the disease. My own clinical studies in cases that have developed arteriosclerosis under observation have convinced me that in the early stages there is a condition of decreased tension with a tendency to temporary or paroxysmal elevations. In such cases I have not been able to persuade myself that there ever is continued hypertension, and I am, therefore, disposed to believe with some pathologists that the earliest condition in arteriosclerosis is one of loss of elasticity in the vessels from changes either in the media or intima, or both, that the changes are initiated by toxic alterations (degeneration) of the vessel walls and not by spasm due to such toxic agents. Beside the reason given (the arterial pressure in developing cases) I would base this view on certain clinical symptoms, such as paroxysmal sweating, variable quantity of urine, and temporary and slight edema. Whether, however, there be spasm or relaxation of the peripheral vessels in the early stages, there are certainly altered conditions of circulation in the peripheral vessels, and in view of the fact that the changes are more or less wide-spread in every organ of the body one readily appreciates that generalized disturbance of function will occur. If one trace back the history of cases of rapidly developed general arteriosclerosis, one

will find a gradual development of certain symptoms that indicate such a falling off or perversion in organic function as the postulated conditions would probably occasion. Loss of vitality, decreased resistance to external conditions and a tendency to slight infective ailments, nervous depression, various organic derangements, moderate circulatory disturbances—these are among the early signs of the beginnings of the disease. They may with some probability be referred to the derangement of the intimate circulation of the organs of the body and perhaps to metabolic disorders, partly due to the original cause of the disease and partly to the effects of the vascular disease on organic action.

Among the varieties of early arteriosclerosis, I have observed several more or less distinct types: nutritional, neurasthenic, and nervous.

Nutritional Type.—The cases of this group present more or less obscure disturbance of general health with a tendency to digestive disorders and anemia or pseudoanemia. There may be little loss of weight at first, but in rapidly developing cases emaciation may proceed rather steadily. In some there is the appearance of a causeless progressive deterioration of health; in these cases a tendency to acute infective diseases in themselves perhaps trifling in character may be conspicuous. I have in mind instances of individuals who during the developing period of a presenile arteriosclerosis suffered repeated attacks of laryngitis, bronchitis, and other minor ailments of this sort. The impairment of health was out of proportion to the character and severity of the infective disease and probably more dependent on the underlying cause than on the acute incident.

I have elsewhere spoken of the importance of pseudoanemia in the diagnosis of arteriosclerosis. As a rule it is a condition of the more advanced stages, but sometimes makes its appearance rather early. I believe it is more largely the result of contraction of the vascular channels with resulting pallor than of deterioration of the blood.

Neurasthenic Type.—In some of the cases of beginning arteriosclerosis with or without definite nutritional disorders, the patient presents various evidences of neurasthenia. Perhaps the most striking instances are seen when arteriosclerosis occurs in the fat, but sometimes it becomes progressively more marked as emaciation proceeds. It is, of course, difficult to distinguish between the neurasthenic symptoms that may attend a developing arteriosclerosis and such secondary arteriosclerosis as may engraft itself upon a preëxisting neurasthenia.

There are no special symptoms that distinguish this type of neurasthenia from others, excepting that circulatory symptoms are perhaps more common.

Nervous Type.—Besides the neurasthenic variety there are types of arteriosclerosis in which certain nervous symptoms are conspicuous. When the hardening of the vessels is considerably advanced, various central nervous symptoms may be met with, such as temporary paresis, spasmodic or convulsive disorders, or disturbances of consciousness. In earlier stages, however, minor symptoms, such as a tendency to vertigo, tinnitus, and disturbing sounds in the ears or syncopal attacks, may occur. Peripheral symptoms of the type of claudication are met with in a variety of forms. In a few reported instances there has been extraordinary muscular weakness, even when collateral circulation had developed quite extensively. Migraine and neuralgic troubles also figure among the minor forms of nervous symptoms in the early stage.

In the more advanced stages arteriosclerosis is easily recognized by the discovery of palpa-

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ble thickening of the blood-vessels, by the increased vascular tension, by the auscultatory phenomena at the heart, and by the general appearance of the patient. The disease presents itself in a variety of forms or types, according to the special involvement of one or another of the important viscera, or by certain special vascular conditions. I have been in the habit of classifying such cases under the following headings: (1) the thoracic type, of which we may distinguish the (*a*) cardiac or (*b*) aortic; (*b*) the abdominal type, of which there are (*a*) renal, (*b*) intestinal, (*c*) pancreatic, and (*d*) hepatic varieties; (3) the cerebrospinal type; and (4) the arteriocapillary type.

It is unnecessary to discuss each of these at length, but a few words about the more important features may be added to complete the presentation of my subject.

In the cardiac variety there may be moderate disturbances of the heart's action with a tendency to arrhythmia, more pronounced symptoms of myocarditis, or even the symptom-complex which we designate as angina pectoris. The immediate occasion of these disturbances is doubtless in the majority of cases some special involvement of the coronary vessels. It cannot, however, be denied that without special involvement of these vessels there are sometimes cardiac lesions and symptoms resulting from the general vascular disease and the undue strain placed upon the heart.

By the aortic type I mean not merely those cases which show a tendency to fusiform dilatation of the arch or aneurism, but also cases in which without dilatation the arch of the aorta is involved in a marked process of sclerotic and calcareous change and in which there are symptoms of cardiac embarrassment and physical signs indicative of roughness in the lining of the aorta at this point. These cases it is important to recognize as being distinguishable from cases of aortic stenosis, with which there is a certain resemblance in their physical signs.

The renal variety manifests more or less markedly the well known symptoms of chronic interstitial nephritis. In a great majority of cases of advanced arteriosclerosis, slight albuminuria appears from time to time, and hyaline casts are occasionally seen. Only in a minor proportion of the cases do the renal conditions advance to a stage of well defined interstitial nephritis. This sometimes stands out conspicuously, while the arteriosclerosis is less evident. On the other hand, in certain cases, it may be at once apparent that the renal disease is but a part of the arteriosclerosis, which is the more pronounced condition.

Intestinal types of arteriosclerosis are less commonly recognized. Atrophy of the mucous membrane, and a tendency to chronic colitis, ulcerations in the upper part of the small intestine, and forms of sudden painful obstructions (paresis of the walls) of the bowel are among the more important intestinal conditions.

Pancreatic cirrhosis as a part of general arteriosclerosis is unusual and rarely presents clinical symptoms sufficiently distinctive to make it recognizable during life. In some cases the pancreatic lesion may occasion diabetes.

Hepatic cirrhosis as a consequence of arteriosclerosis is less likely to occur than are sclerotic lesions of other organs, for the reason that the circulation of the liver is so freely anastomotic, and that the artery supplying the liver is comparatively speaking a minor factor in the circulation of the organ. When this disease does exist in association with arteriosclerosis, it is more likely that the same cause had been operative to produce both conditions than that either was a sequence of the other.

Cases of the cerebrospinal type of arteriosclerosis are numerous and varied in the more advanced stages, when the vessels have become

greatly thickened, temporary palsies or aphasia, slight convulsive seizures, suggesting petit mal, and attacks of sudden unconsciousness occur. Probably a number of definite nervous diseases of cerebral causation have as their underlying basis arteriosclerosis of the cerebral vessels. It is impossible to discuss these at the present time.

By the arteriocapillary type I mean cases in which either in the presenile or the senile period of life generalized arteriosclerosis occurs without definite local organic involvement; in which, in other words, the condition of the vessels alone is conspicuous, and moderate circulatory disturbances alone call attention to the vascular disease.

PATHOLOGY AND DIAGNOSIS OF MYOCARDIAL INFLAMMATIONS AND DEGENERATIONS.[1]

BY JUDSON DALAND, M.D., PHILADELPHIA, PA.

The comparative importance of myocarditis to other pathologic changes in the heart muscle steadily diminishes as knowledge increases, and in this respect resembles the progressive changes that have taken place in recent years regarding our concepts of encephalitis. Formerly most of the morbid changes in the myocardium were believed to be inflammatory, but more recent investigations show that most of the more important chronic affections of this muscle are true degenerations. The relation of inflammation to degeneration of the heart is most complex and confusing. Either may exist independently, or one or the other may precede or follow, or both may occur simultaneously.

A satisfactory classification is difficult, as various lesions merge into one another. Two great groups may be recognized—the inflammations and degenerations—each of which may be acute or chronic, circumscribed or diffuse.

According to Camac, myocardial diseases may be grouped clinically as (1) acute, (2) chronic, (3) systemic, (4) mechanical—all of which may be classified under insufficiency of the heart with or without valve murmur.

Myocarditis may occur as an independent affection or in association with fatty and other degenerations. It may be acute or chronic, circumscribed or diffuse. The intermuscular connective tissue is swollen and infiltrated with small round or spindle-shaped cells and leucocytes. The blood-vessels are dilated and their walls show proliferative thickening. The muscle fibers are usually degenerated and become granular, opaque, and lose their striæ. Occasionally segmentation has been observed. The muscle fibers may undergo fatty and occasionally the hyaline degeneration of Zenker. Myocarditis may be caused by the toxins of typhus, typhoid fever, scarlet fever, diphtheria, rheumatism, gout, acute, chronic or recurring endo- or pericarditis, gonorrhea, malaria, pneumonia, influenza, streptococcus tonsillitis, and may be occasionally provoked by prolonged intestinal toxemia.

Suppurative interstitial myocarditis or abscess of the heart was first recognized in the fifteenth century by Benivieni. This process may be acute or chronic, and, as it is usually embolic, the abscesses are usually multiple. The most frequent cause is ulcerative endocarditis, although it may be induced by any of the causes that produce pyemia. These abscesses vary in size from a mere point to a small hen's egg. Perforation may take place

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into one of the cavities of the heart or the pericardial sac, which in turn may be followed by aneurism, rupture, or hemopericardium. As a rule death occurs, although rarely the pus becomes inspissated and later encapsulated.

Chronic myocarditis is usually circumscribed, although it may be diffuse, and is induced by the continued action of the causes of acute myocarditis, or as an end result. It is not infrequently observed in arteriosclerosis and endarteritis, especially the obliterating variety due to syphilis. It is frequently combined with myocardial degeneration, and has been described by Huchard as dystrophia-sclerosis. Certain forms of chronic myocarditis have been observed that were primarily periarterial or perivenous in origin.

Acute parenchymatous degeneration of the myocardium was first described by Virchow as an inflammation. This process is a true degeneration, although it occurs in myocarditis. The heart is unusually soft and pale and the entire organ is involved, more especially the left ventricle. Histologically, there is degeneration of the muscle fibers, which are finely granular, which granules resist the action of ether, and are dissolved by acetic acid. When the process is well advanced the striæ are invisible. Associated interstitial myocarditis is sometimes observed. This process has been found in typhoid fever, typhus, diphtheria, variola, rheumatism, and other infections, the active agent, in all probability, being a toxin elaborated by these various microörganisms. Osler maintains that there is no etiologic relation between high fevers and this degeneration.

Segmentation and fragmentation are regarded by certain authors as artefacts, or that the cement substance is dissolved by the action of unknown ferments. This condition, which has been called fragmentary myocarditis, was described by J. Renault in 1889, and soon after by his pupils Mollard and Lepine, since which time the subject has attracted the attention of many pathologists. In segmentation the muscle fibers are sometimes separated at the cement line, but more frequently near the center, whereas in fragmentation the fibers are fractured transversely, usually on a level with the nucleus. This condition is extremely common, and according to McFarland occurs in upwards of 50 per cent of adult hearts examined.

Chronic fibroid degeneration of the myocardium or cardiosclerosis has been designated by Huchard as arteriosclerosis of the heart. This condition is usually more or less circumscribed, occurring in spots, streaks, or lines following the direction of the muscle fibers. This process frequently affects the corni-arteriosi, chorda tendineæ, and papillary muscles. Certain sclerotic areas are due to infarcts. The connective tissue between the muscle layers and bundles is increased, and from pressure and faulty nutrition the muscle fibers undergo atrophy and fatty degeneration. It occurs as a consequence of certain forms of interstitial myocarditis, arteriosclerosis, endarteritis, acute or chronic endo- or pericarditis, chronic passive congestion, and in the terminal stage of many of the hypertrophies of the heart. The most important cause of cardiofibrosis is the interference with the coronary circulation from sclerosis or valvular disease, thereby causing malnutrition of the heart muscle by diminishing the blood-supply to that organ. The causes of arteriosclerosis are the remote causes of cardiofibrosis.

Four principal views have been held regarding the structures primarily affected in this disease: (1) That it originates as an inflammation of the muscle fibers, and this view, although at first popular, has been discarded; (2) that the interstitial tissue is first involved and that the process is inflammatory, which view was first advanced by Corvisart and accepted by Bristowe in 1842, who called it "Cardiac Cirrhosis;" (3) that the process begins in

the vessels as a periarteritis extending by contiguity; (4) Huchard, Weigert, Huber, Zeigler, Leyden, and others believe that cardiac cirrhosis is a degeneration of the myocardium due to faulty nutrition, the results of diminished blood-supply to the heart muscle, caused by arteriosclerosis.

I am of the opinion that Huchard's view of the pathology of fibroid degeneration of the myocardium is the correct one, and explains satisfactorily many of the pathologic and clinical conditions observed in this disease.

Sclerosis of the arteries may produce cardiac fibrosis by interfering with circulation: (1) by encroaching upon the lumen of the coronary arteries or their branches; (2) by encroaching upon the orifices of the coronary arteries in the aorta when this vessel is sclerosed; (3) by diminishing or disturbing the balance of the coronary circulation when the sclerosed aortic valve permits regurgitation; (4) by producing hypertrophy of the heart in general arteriosclerosis, which hypertrophy may undergo fibroid degeneration.

When arteriosclerosis is well marked, the myocardium in certain cases preserves a fair degree of functional integrity, provided the coronary suffers no more than the remainder of the arterial system. Rapid thrombosis may cause myocardial malacia and slow thrombosis sclerosis, when these processes occur in cardiac cirrhosis.

The heart may be normal in size, but is more usually enlarged, due to thickening of the walls and dilatation of the cavities. It is usually globular or conical in shape, due to the greater involvement of the left ventricle, or it may present a bilobed appearance, when the right ventricle is also greatly involved. Its consistency is increased, and the muscle is hard and resistant. The color of the heart is normal, excepting in the sclerotic areas, which are pure gray or yellowish, and are rarely uniform in color and do not resemble the "dead leaf" appearance presented by the myocarditis of acute infection. Fatty degeneration is often present and is variable as to site, intensity, and extent, and may follow the vessels or envelop the heart, especially the posterior portion. It is usually more marked in dilated than in hypertrophied hearts. Huchard maintains that the heart is always hypertrophied and dilated and that the former precedes the latter, which is a terminal condition. Section of the heart reveals, in the midst of almost normally colored muscles, sclerotic areas, lattice-like or in bands or star-like points, or elongated or oval islets, which may be discrete or confluent, millet-seed or pin-head in size, as large as a grain of corn, or even involving a large part of the walls. The color is mother-of-pearl, bluish, ashy, or gray. The cardiac muscle is slightly elevated about these areas, somewhat resembling microscopic infarcts. In obliterative endarteritis most of the islets of fibroid degeneration are disseminated. These areas are described as adult. The young sclerotic area resembles the adult in form and distribution, but differs in color, being of a dirty-gray or yellow, and is less dense, moist, and not depressed below the surface of the surrounding myocardium.

The central portion of the heart is more frequently involved than the periphery, the order of frequency being the left ventricle, the papillary muscles of the mitral valve, the interventricular septum, the walls of the left ventricle, and finally the walls of the right ventricle. When sclerosis involves the septum or ventricular walls, it usually affects the inferior third of the organ, as this region is supplied by the anterior ventricular artery, a branch of the left coronary, which artery is frequently affected by vascular lesions. In forty-four arteriosclerotic hearts, thirty-one showed marked involvement of the left coronary; in six cases both cor-

onaries were equally affected, and in seven the posterior coronary was not affected. Small lesions situated in important parts of the myocardium produce more serious symptoms than larger lesions elsewhere. As the coronary arteries are frequently end-arteries, when their walls are thickened and the lumen diminished or obliterated, the degenerated myocardium supplied by such a vessel receives but little nourishment from the surrounding vessels, and occasionally there is produced a genuine necrobiosis.

Fatty degeneration of the heart may be circumscribed or diffused, primary or secondary. The heart is usually enlarged, although it may be normal, and in well marked examples of the diffuse form the color is grayish-yellow, the muscles relaxed, flabby, soft, and friable. The unsupported heart falls into a shapeless mass, and upon section the sharp edge of the cut surface is absent. The hand recognizes the presence of fat, which may be seen upon the knife or floating upon the alcohol in the vessel in which the heart is contained. From this extreme degree of fatty degeneration of the heart, the amount of muscle involved may vary and even be so small as to be only recognizable microscopically. The areas of fatty degeneration are irregular in size, shape, and distribution, although they are more commonly seen in the left ventricle, the papillary and pectinate muscles, and beneath the endo- or pericardium when these membranes have been inflamed. Frequently there is a yellowish mottling in streaks or patches. This degeneration is found in (1) toxic conditions, such as alcohol, phosphorous, arsenic, and sulphuric acid poisoning; (2) infections, such as acute yellow atrophy of the liver, infective fevers, such as diphtheria, puerperal fever; (3) dyscrasiæ, such as occur in severe malnutrition from any cause, tuberculosis, carcinoma, diabetes, old age. Local anemia from obstruction of the coronary artery, or severe long-continued general anemia, from any cause, as, for example, pernicious anemia, may cause fatty degeneration.

Arteriosclerosis is more apt to produce cardiofibrosis, but occasionally fatty degeneration is also associated. Under such circumstances the causes of arteriosclerosis may be the remote causes of fatty degeneration. Fatty infiltration and hypertrophy of the heart, from chronic heart disease, is frequently associated with fatty degeneration of the heart. The heart is usually enlarged, although it may be normal in size. The apex beat is usually invisible and cannot be palpated, the first sound of the heart is exceedingly feeble and valve-like, and the aortic second may be accentuated. Not infrequently an apex systolic murmur is audible, due to dilatation of the left ventricle.

Fatty heart or obesitas cordi may exist (1) as a simple increase in epicardial fat which may envelop the entire heart, or follow the grooves of the blood-vessels on the surface of the heart, and has been designated by Anders as subpericardial overfatness; (2) as an infiltration, the fat extending between the muscle fibers, occasionally as far as the endocardium, especially when the right ventricle is involved. Microscopically, the muscle fibers may show atrophy or fatty degeneration. The heart is usually relaxed and dilated.

This condition occurs in obesity with anemia, and may be inherited, or acquired by overeating or overdrinking, excess in the use of alcoholic or malt liquors in those past middle life, following a sedentary occupation. It frequently occurs in women at or after the menopause, and according to Forschheimer it is almost three times more frequent in males than in females. Eighty per cent of the cases occur between the fortieth and seventieth years. Romberg believes that cardiac insufficiency in the obese is caused by the relative smallness and weakness of the heart muscle due to the disproportionate demand made upon the circulation

by general corpulency, and states that it usually occurs in the obese who are indolent, sedentary, overindulgent in food and drink, and in those whose musculature is flabby, and is especially common when anemia is present. In the active and muscular obese individual, the heart muscle increases in size in accordance with the demands made upon it by the increase of fat.

Brown atrophy of the heart occurs most frequently in senility, and also in the later stages of chronic valvular disease, tuberculosis, carcinoma, etc. The heart is dark-red-brown in color, small, hard, and wrinkled, and has been compared to a dried pear. The muscle fibers show yellowish-brown pigment, chiefly around the nucleus. It is frequently associated with fatty degeneration of the heart.

Amyloid degeneration of the heart occurs in the intermuscular tissue, blood-vessels, and beneath the endo- and pericardium, and does not affect the muscle fiber. It is due to the same cause which produces amyloid degeneration elsewhere, and is of rare occurrence.

Hyaline degeneration of Zenker, according to Osler, is sometimes met with in prolonged fever. The affected fibers are swollen, homogeneous, translucent, and the striæ are very faint or absent. It is usually associated with parenchymatous and sometimes with amyloid degeneration of the heart.

Calcareous degeneration of the heart is a rare disease in which the myocardium is infiltrated with lime salts.

The limits of this paper do not permit of a discussion of the relation of myocardial disease to the nervous system.

Diagnosis of Myocardial Disease.—An absolute diagnosis of the different myocardial inflammations and degenerations cannot be made, but a probable diagnosis is sometimes possible. Extensive disease of the myocardium may be present with few or no symptoms, and a small lesion situated in an important part of the heart may induce urgent and distressing symptoms or sudden death. The symptoms of myocardial disease may be present and the autopsy demonstrate its absence, and *vice versa.* Cabot's statistics show that in ten cases the autopsy confirmed the diagnosis, in three the autopsy showed no myocardial disease, and in five in which myocardial disease was discovered at autopsy no diagnosis was made during life. Occasionally in the midst of apparent good health, death from myocardial disease may occur from asystole or angina pectoris. Cardiac weakness may be the only sign of advanced myocardial degeneration in terminal pernicious anemia. The symptom-complex may be the same in various affections of the myocardium and the same disease may present different clinical pictures. Babcock well says that in no disease does the diagnosis depend more upon judgment and experience than in myocardial affections, the diagnosis of which often resolves itself into a question of probability. Many cardiac symptoms in elderly individuals are due to myocardial disease rather than to endocarditis, which is so frequent in the young.

The muscles, circulating fluid, and the nerves must each be considered in the clinical study of myocardial disease.

Dilatation may lead to sudden death in myocardial disease, or the symptoms and signs of dilatation may be the first clinical manifestations of disease of the heart muscle.

The difficulties of diagnosis are well illustrated by the following case:

A man, aged 40 years, a West Indian by birth, who gave a history of careless living, coupled with various excesses. He denied syphilis. When examined he complained of no symptoms referable to the heart, but showed to an extreme degree all manifestations of terror in anticipation of his execution by hanging the following morning. He was above the

average height, well built, and was fairly well nourished. Examination showed a feeble apex beat, which was slightly displaced to the left. The heart dulness was increased to the left, the first sound was feeble and resembled the second. A systolic murmur was heard at the aortic cartilage and was transmitted into the vessels of the neck, and the aortic second sound was accentuated. The peripheral arteries showed moderate fibrosis.

The antemortem diagnosis was arteriosclerosis, aortic valve sclerosis, and cardiofibrosis. The pathologic diagnosis was moderate arteriosclerosis, moderate dilatation of the arch of the aorta, no sclerosis of the aortic leaflets nor cardiofibrosis, left ventricular hypertrophy, and dilatation with a normal myocardium. The weakness of the first sound of the heart was probably due to slowing of the systole from inhibition due to terror. The aortic systolic murmur was due to dilatation of the arch of the aorta.

A case that has been published in full elsewhere, under the care of Dr. Leopold, illustrates the latency of cardiofibrosis.

The patient was a syphilitic alcoholic, aged 54 years, who suffered from an obscure attack of heart trouble four years before death, from which he nearly perished, and afterwards remained in good health until his death. One year later he was examined for life insurance and was considered a good risk. Early one morning, after a wakeful and restless night, he became unconscious, with cyanosis, no radial pulse distinguishable, heart sounds slightly accelerated, shallow respiration, absence of pupillary light reflex. In a few minutes he regained consciousness, and after a movement of the bowels he again became unconscious, with complete muscular relaxation, and the attending physician thought he was dead. A partial reaction followed free stimulation. Vomiting occurred, each act of which was followed by syncope. The pulse rate was 25 to 30 per minute; cardiac sounds were indistinct, and moist râles were observed over the bases of the lungs. The entire skin surface was cold from beginning to end. At 8.30 A.M. the patient was conscious and stated that he felt badly, but experienced no pain. Vomiting continued, and sixteen hours after the beginning of the attack the patient was fairly comfortable, although there was cyanosis, cold extremities, a pulse-rate of 55 per minute, occasionally disappearing, and contracted pupils. Three hours later the radial pulse disappeared, the extremities became cold, cyanosis deepened, respiration 45 to 50 per minute, and death occurred suddenly. The autopsy showed extreme obstruction of the right coronary artery, the orifice of which was narrowed to a size permitting of the passage of a hairpin, and the walls throughout its entire length showed obliterating endarteritis with the local enlargements almost occluding the lumen of the vessel. The left coronary showed well marked fibrosis at a point below the giving off of the left interventricular branch; the vessel was entirely occluded by a recent thrombosis. The interventricular septum was occupied by a large, white, irregularly-rounded area of fibroid degeneration, measuring 2x2½ inches. A fleshy column passing from this region to the opposite wall had also undergone fibroid changes, as well as a portion of the wall of the left ventricle, which was aneurismal. Sclerosis was so extreme and extensive that there could be but little doubt that at the time of the physical examination, three years before death, there was considerable cardiofibrosis, during all of which time there were no symptoms.

The most important symptoms of cardiac insufficiency in myocardial disease are tachycardia, irregular or feeble small pulse, gallop-rhythm; dyspnea, which may be continuous, paroxysmal, nocturnal, or induced by slight

exertion, arrhythmia, bradycardia, cardiac pain or distress, angina pectoris, palpitation, edema, cough from pulmonary congestion, and Stokes-Adams syndrome (tachycardia, feeble small pulse, dyspnea, and arrhythmia). Krehl considers arrhythmia as pathognomonic, and others believe it evidences involvement of the auricles. Arrhythmia may be the only sign of this disease. Examination shows a weak heart, which is usually enlarged, and there may be more or less edema.

When, in the absence of renal disease, the symptoms of acute cardiac insufficiency occur, with or without valve murmur, in the course of the infectious fevers, pyemia, gonococcus infection, or acute peri- or endocarditis, together with signs of an enlarged weak heart, acute interstitial or parenchymatous myocarditis may be present. Some believe that the failure of the pulse to increase in frequency in changing from the recumbent to the sitting posture is an early sign of myocardial disease.

Fatty degeneration of the heart may be suspected during the course of acute yellow atrophy of the liver, infective fevers such as diphtheria, puerperal fever, and in the dyscrasias, such as tuberculosis, carcinoma, diabetes, old age, and in poisoning by alcohol, phosphorus, and arsenic. It is especially apt to occur in pernicious anemia. The usual signs of cardiac insufficiency may be present, and Cheyne-Stokes breathing is not uncommon.

Fatty heart may occur in those who appear well nourished with pallor or cyanosis, dyspnea, especially on exertion, vertigo, and attacks of palpitation when at rest or after exertion. The pulse is soft, very rapid, non-resistant, with hypotension, and there may be tachycardia, and in certain cases bradycardia, with a pulse-rate of 48 per minute. Accentuation of the pulmonic second sound may be caused by congestion of the venous system, shown by the presence of hemorrhoids, varicose veins, etc. The apex beat is usually invisible and cannot be felt, and the area of cardiac dulness is usually enlarged. The muscular element of the first sound of the heart may be greatly diminished—in other words the physical signs of a weak heart.

It must not be forgotten, however, that the apex beat may be lost because of the excess of fat in the chest wall; cardiac dulness may be enlarged and widened, due to the excess of fat in the abdomen, pushing the diaphragm upward, and so placing the heart horizontally, thus simulating the percussion outline of an enlarged heart. A feeble cardiac first sound may be due to excess of fat in the precordial region, and a weak pulse may be due to excess of fat around the radial artery. Dyspnea may be due to the excess of fat on the body, interfering with the action of the heart and lungs.

Diagnosis depends upon the existence of obesity, the habits of the patient, cyanosis, and angina pectoris, especially when it occurs while at rest, bradycardia, tachycardia and arrhythmia.

Brown atrophy of the heart, when it occurs in the aged or during wasting diseases, such as tuberculosis or carcinoma, may be suspected, when, in addition to the symptoms of cardiac insufficiency, physical examination shows a decrease in the size of the heart. When this degeneration is secondary to chronic valvular disease the heart may be enlarged.

Abscess of the heart, segmentation and fragmentation, amyloid or calcareous degeneration, are only recognized at autopsy.

BERIBERI.[1]

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It has been suggested to me that I write a short sketch of beriberi based upon my observations of the disease in the Orient and elsewhere. I have felt some hesitancy in acceding to this request, as I know that the members of a society for the study of tropical diseases are better acquainted with the recent literature of beriberi than I am. It is likely, however, that I have seen and treated more cases of beriberi than many of you, and perhaps some of my recollections may serve to occupy an hour.

I saw the first cases of beriberi many years ago on my first cruise to Japan, when they were shown me by Dr. Simmons, an American physician long resident in that country, who was one of the earliest writers in English upon this disease. He had been long employed by the Japanese government, and at the time of my visit was in charge of a hospital near Yokohama. I well remember his taking me through the wards where there were many patients suffering with beriberi, or kakke, as it is called in Japan. Some years later, on my second visit to the East, I saw the disease again, and on my recent tour of duty in Cavite I again renewed my early recollections. At different times I have seen the disease in naval hospitals in our own country, and have treated it on board ship.

In a short article I cannot dwell long upon the history of the disease or upon the theories which have been put forth to explain its occurrence, but it is impossible to omit entirely their consideration.

Beriberi is mainly a disease of warm countries, but well-marked outbreaks have been observed in temperate regions in almost every part of the world, as shown by epidemics in insane asylums in Ireland and in our own country, and the rather frequent occurrence of it upon fishing vessels upon the banks of Newfoundland. It is not improbable that many cases of the disease have been overlooked or wrongly diagnosed, and even in our own country we may rather unexpectedly meet with it. This is particularly liable to happen in our seaport towns among the sailors who have just landed after a long voyage from the tropics. In London it is not uncommon to see cases among the Asiatic sailors on the steamers from the East.

Within the last few years it has been universally recognized that beriberi is a multiple neuritis affecting the peripheral nerves both motor and sensory. In severe cases the vagus and its branches are also affected. More rarely other nerves, as the phrenic, are attacked. The symptoms are those of paralysis, both of motion and sensation, usually attended with edema, and when the vagus is implicated there are severe cardiac complications. While we know that beriberi is a multiple neuritis, there is great difference of opinion as to the cause. We do not know whether it is animal or vegetable, protozoön or bacillus, and in spite of an immense amount of work we know little more of its etiology than we did a generation ago.

Theories of all sorts have been proposed to account for the disease, and I will rapidly mention some of those most generally supported.

The malarial origin and later the hook-worm theory were stoutly maintained, but have long since been abandoned. Many observers believe that it is a disease of nutrition, but they do not

[1]Read by title at the annual meeting of the American Society of Tropical Medicine, held in Philadelphia, March 21, 1906.

agree as to what particular article of the diet is at fault. There are at least three of these theories which are still actively supported:

(*a*) Deficiency in the nitrogenous articles of the diet is believed by many to be the cause.

(*b*) Deficiency in the fatty articles of food is ascribed by others as the cause.

(*c*) A diet containing too much rice, rice of an inferior quality, or improperly prepared, is still believed by many to be the cause.

Certain epidemics or outbreaks have occurred which seem to support each of the above theories, but no one of them will satisfactorily explain any large number of outbreaks.

I believe that the theory of Scheube, Baelz, and others is the one most likely to be correct, and explains most satisfactorily the largest number of cases. They think that beriberi is an infectious disease due to a living germ of yet undetermined nature, that it can be carried from place to place, and where it meets a suitable field with favorable conditions of moisture, heat, and overcrowding, very probably aided by a meager diet, it will multiply, and entering the body either by the lungs or stomach produces a poison or virus which causes a neuritis. According to this theory a new locality may become infected and a new outbreak of the disease occur. The views of Dr. Hamilton Wright are probably familiar to you and are now looked upon most favorably by many. He believes that the specific organism is ingested with food or drink, multiplies in the stomach and duodenum, causing primarily a gastroduodenitis, and elaborating a virus which poisons the peripheral terminations of the vagus and other nerves.

We see, then, that there is a great diversity of opinion as to the etiology of beriberi, one school believing that it is a disease of nutrition, and the other that it is an infectious disease due to some germ not yet discovered. While the first theory is perhaps more generally believed, I think the second is more probably the true one. Scheube, one of the greatest authorities on tropical diseases, and who observed very many cases of the disease during his long stay in Japan, gives the following cogent arguments for regarding it as an infectious disease:

1. That strong, well-nourished young males are most frequently attacked, and are particularly liable to the severest forms of the disease.

2. Beriberi has narrowly defined districts in which it is most prevalent. How closely limited and circumscribed these areas may be is shown by the fact that the disease may be confined to certain wings and stories of the same building.

3. The conditions of the weather, heat and moisture, exert great influence upon the prevalence of the disease.

4. During recent years the disease has shown a great tendency to spread, and is now far more widely distributed than it was fifty years ago. This extension of the disease has taken place without any change in the food of the people. It is far more prevalent in Japan than it was a generation or two ago.

5. Like other infectious diseases beriberi shows a marked tendency to periodic fluctuations, quite independent of any changes in food. It appears in a country, prevails severely for a while, then diminishes in frequency and severity, only to break out again after an uncertain interval of time.

Beriberi is undoubtedly carried by man like other infectious diseases. Coolies, convicts, and laborers have carried it to places where it was previously unknown, and have served as foci from which it has spread, infecting the district.

In the tropics the dark-skinned people are more often attacked than white residents, and in the East you will see few cases among Euro-

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peans and Americans. This immunity is due less to race than to more favorable conditions of life, and when white men are exposed to exactly the same conditions they suffer as much as the dark-skinned people. In the outbreak at Tuscaloosa, Alabama, the percentage of the white patients who were attacked was greater than that of the black.

We know that there are certain conditions which favor the development of beriberi, and the most prominent of these factors are moisture, heat, overcrowding, and, in general, poor hygienic surroundings. In the tropics the rainy season will witness more cases than the dry, and when the disease becomes endemic it is far more frequent in low-lying localities, and particularly where the soil has been recently disturbed. Crowded, poorly ventilated habitations afford very favorable soil for the development of beriberi. Frequent outbreaks have occurred in barracks, asylums, and prisons. Similar conditions on board of ships have preceded the appearance of the disease. In Manson's well known work there is a graphic account of a vessel in London where beriberi attacked the Indian crew, and where the crowded forecastle with its heated, steaming atmosphere produced just the conditions favorable for its development. The crews on the fishing vesels which go to the Banks of Newfoundland are frequently attacked, and there are many outbreaks recorded both by American and French writers.

Turning now from the etiology of the disease to a consideration of the clinical features, we find that there is much variety in the symptoms which mark the invasion of beriberi. Catarrhal symptoms of the air-passages, stomach, and intestines are rather frequent, and with them is languor and heaviness in the legs, with some loss of power. The arms may be similarly affected, but usually to a less degree. Anesthesia of the skin with tenderness of the underlying muscles has been reported by some observers. The heart may be involved, and palpitation is frequent, often accompanied with shortness of breath. These symptoms I have described are quite characteristic and typical but they are by no means constantly present, and often are so mild that they pass unnoticed. This is particularly common when the patients are Asiatics, who persist in working until the disease is well advanced, and who usually cannot give a very good account of the attack owing to their ignorance of the physician's language. Dr. Hamilton Wright believes that symptoms of gastroduodenitis quite commonly exist, particularly in the acute type. Very recently I had the opportunity of talking with Baron Takaki, who is well known for his successful efforts in stamping out the disease, which was frightfully prevalent in the Japanese navy twenty-five years ago. I asked him if gastrointestinal symptoms were common at the beginning of the disease, and he told me that they were, ascribing them to the diet, which contained so much rice. I think then that we may assume that gastroduodenitis is a common initial symptom, especially in the acute form of the disease.

You will find several different varieties of beriberi given by different writers, but for our purpose I think it is more convenient, if not so scientific, to divide it into the three types of acute, subacute, and chronic. The acute type is a natural and well-defined variety. The subacute type includes a great variety of cases, some almost as severe as those of the first variety, and others which are mild from the start. The chronic forms are also manifold, but all have the common feature of persisting for a time varying from months to years.

The acute form is mostly seen in the tropics, and even there it is not very common, being much less frequent than the other varieties. Symptoms of gastroduodenitis are particularly

frequent in this variety. It is shown by a feeling of heaviness and weight in the stomach, some tenderness on pressure, and perhaps nausea and vomiting. Even this early in the disease, or at the longest in the course of a day or two, there is some disturbance of nerve function. The knee-jerks disappear, hyperesthesia, paresthesia, or anesthesia is noticed, most marked in the front of the legs. The forearms are also affected, but less frequently. Along with the disturbances of sensation may occur paralysis of the motor nerves. These, too, are more common in the legs, less frequent in the upper extremities. Some anasarca is often present, but frequently nothing more than edema of the front of the legs. These symptoms are commonly present in greater or less degree, and are more marked if the case survives several days.

The most important and characteristic symptoms of this type are those manifested by the heart. Palpitation and then labored action of the heart is pronounced. The area of impulse is much increased to the right and in the epigastrium, the vessels of the neck throb violently. On auscultation the rhythm is found much altered and murmurs are present.

Shortness of breath, soon increasing to marked oppression, and extreme dyspenea are almost invariably present. The patient complains that the chest feels as if compressed by an unyielding band, or in other cases as if the chest would burst asunder.

The heart soon becomes dilated, the lungs engorged, and the cardiac oppression and dyspnea increase to a veritable agony, perhaps accompanied with persistent thirst and vomiting. The pulse is rapid, intermittent, and feeble, even when the action of the heart seems so violent. Cyanosis appears, the skin grows cold, and death soon ends the patient's tortures.

In addition to these symptoms the diaphragm, larynx, and pharynx are in some cases paralyzed. The patient always dies; sometimes he may linger a week, rarely so long, generally dying in four or five days, and in the severest form in a few hours. The severity of the symptoms in this variety is due to the rapid and fatal poisoning of the vagus nerve, both cardiac and pulmonary branches being affected beyond repair. The involvement of the vasomotor nerves, with the effusions into the serous cavities of the chest, adds much to the patient's sufferings.

The subacute form is much more common than the acute variety, and with the chronic includes the cases you generally see in the hospitals in the East.

The subacute variety embraces cases with very different clinical features. Some are almost as severe as the acute type, but are not so rapidly fatal, others recover entirely, while very many, either directly or after a period of greater or less improvement, pass into the chronic form. The invasion of this variety is usually gradual, and the symptoms slowly develop. Usually in the front of the legs there is some perversion of sensation—pricking, smarting, burning, itching, and formication are all common. In some cases there is hyperesthesia, but this is not so common as paresthesia. Anesthesia more or less marked is almost always present, and is superficial rather than deep. These disturbances of sensation are most marked in certain well-defined regions of the body. The skin in front of the legs over the tibiæ, on the dorsum of the foot, the front of the thighs, the fingers and forearms, and around the mouth are the favorite sites.

Muscular palsies also develop; at first there may be nothing more than lassitude or a feeling of heaviness, but this soon increases to loss of power. The extensor muscles of the thigh, leg, foot, and forearm are particularly liable to be paralyzed. Some of the facial muscles

are, also, often affected. While the flexor muscles do not escape they are affected to a much less degree. In consequence of these paralyses of the extensors there is foot-drop and wrist-drop. The toes point to the ground and the wrist and fingers are bent. You will see some cases, too, in which the mouth is open from paralysis of the masseter and temporal muscles.

The paralysis varies in degree; in some cases it is only slight, and the patient can walk and help himself, but in others it is so extreme that he is completely helpless and actually cannot move hand or foot. In my experience the trunk muscles are not so often involved. In some cases I have seen contraction of the gastrocnemii which were hard and tender. This contraction may occur in other muscles, and the tenderness on deep pressure is quite characteristic. The affected muscles atrophy and waste to a marked degree, and in what is often called the atrophic or dry form the patient is extremely emaciated. The legs are particularly apt to be atrophied, and the atrophy increases from above downward. The knee-jerk and the tendo Achillis reflex are often absent, as well as the other deep reflexes, while the superficial reflexes are retained. The affected muscles do not react to electrical stimulation either galvanic or faradic.

The sphincters of the bowels and bladder as a rule work normally.

There is another symptom which is present in most cases—edema, and often anasarca. The presence or absence of edema is the reason for the frequent division of beriberi into the wet and dry types, but I believe that there are very few cases in which some degree of edema does not exist at one stage or another. This edema is most common in the legs, on the inner side of the tibiæ, and on the dorsum of the foot, but may be found in any part of the body, and may be associated with collections of fluid in the serous cavities. Dropsy of the pericardium is most frequent, then hydrothorax and ascites. In well-marked dropsical cases the anasarca is pronounced and as prominent as in cases of acute nephritis.

While in subacute beriberi the heart is not so liable to be affected as in acute beriberi, some involvement of this organ is almost always found. Often there is nothing more than an irregular hurried action, particularly noticeable on slight exertion. So long as the patient keeps quiet he may have little discomfort, but if he walks rapidly the pulse jumps from 75 to 100 or more, becomes weak and irregular, and there may be some shortness of breath. In the severer cases the area of pulsation may be increased and there is throbbing of the vessels of the neck. The area of the heart's dulness is often increased, especially to the right, and on auscultation changes in the rhythm and murmurs are frequently heard. The course of the subacute cases is apt to be rather prolonged even when there is complete recovery, due to complete regeneration of the affected nerve tissue. It is usually several months before the patient is well. The anesthesia and other disturbances of sensation gradually pass away, the palsies of the muscles improve until nothing remains but a slight weakness, which in time also disappears. Loss of sensation and motion continues longest in the muscles of the leg, and may persist in a slight degree when the patient is well in other respects. The knee-jerk is lost for a long time, perhaps permanently.

The mortality in this type is low, and the patient usually recovers, or else the trouble assumes a chronic form. There are, however, certain cases of this type which are nearly as rapid in their course as cases of the acute type, differing from them only in being more prolonged. This type takes two or three weeks to run its course instead of a few days; death is due to the same cause, poisoning of the va-

gus; and the clinical features are very similar, but not quite so acute or rapid.

Relapses or recurrences are by no means rare in subacute beriberi. In Japan, after apparently complete recovery, the patient at the end of a year from the original attack is very liable to have a recurrent atttack, and these returns of the disease may occur for years. Exposure to unfavorable hygienic conditions, overwork, and poor food are all favoring factors for a relapse. Recurrent attacks as a rule are mild, but I have known death to occur in them.

A rather striking fatal case of relapse occurred in my own practice many years ago. I was on the old sloop of war *Brooklyn,* which was returning to New York from Japan. The machinery having broken down we were compelled to make the passage under sail. We left Nagasaki about the middle of September, and breaking our voyage at Honolulu for about two weeks, resumed our course for New York, going around Cape Horn. Our progress was slow, and it took us 141 days to reach the next port, St. Thomas. About ten days before we arrived there, when we had been at sea over four months, beriberi appeared on the ship. The only persons affected were the Japanese mess attendants, none of the white or black members of the ship's company being attacked. The Japanese were exposed to exactly the same environment as every one else, and had the same food as the officers. There was no possibility of their obtaining anything else to eat, and their diet was the same as mine, containing little rice and sufficient nitrogen. I do not believe that the ship was infected, and the only explanation of the outbreak was a recurrence of a dormant malady. One of the cases proved fatal, and the symptoms were as severe as in acute cases.

There remains for our consideration the third type, or chronic beriberi, which is a sequel of the subacute variety. A subacute case, when it does not recover entirely, may continue without any notable change and gradually pass into the chronic form, or there may be considerable improvement of all the symptoms, stopping short of complete recovery.

In still another set of cases the patient may have improved so much that he resumed work and kept at it for a while, then broke down, returned to the hospital, and, perhaps, after a while was well enough to work again. These relapses and partial recoveries may continue for years.

Whatever be the history of the chronic type, whether directly following a subacute attack or being a relapse after an interval of improvement or apparent recovery, there is considerable similarity in the symptoms and course of the disease. In those subacute cases which assume the chronic form the anesthesia, paralyses, and loss of reflexes all persist. Edema is usually present, and in some cases there is anasarca. The heart is usually enlarged, and there is palpitation, with rapid, irregular, and feeble pulse. The cardiac symptoms increase in severity, the edema becomes more pronounced, and the paralyses more marked. The patient dies in a sudden collapse, or is carried away by some intercurrent disease.

When the chronic form appears after an interval of more or less improvement, there is a return of the original symptoms which characterized the first attack, and which I have already described to you at considerable length. Chronic beriberi is the type you usually see in visiting the hospitals in Japan and other Asiatic countries. I have seen wards full of these patients, and was impressed by the great variety in the clinical features they presented. It is hard to realize that they were all suffering with the same disease.

These cases of chronic beriberi can be divided into the atrophic or paralytic form and the dropsical form, or, as they are often called,

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the dry and wet forms. There are also many cases of a mixed type which present both paralytic and dropsical symptoms, sometimes the one set, sometimes the other predominating.

The typical paralytic cases present a very characteristic appearance. The legs are much wasted and the shin bones stand out prominently. The muscles of the arm are less wasted, but I have seen some cases in which all the voluntary muscles were more or less affected. Along with this atrophy there is loss of sensation and power. The loss of power from paralysis of the nerves and atrophy of the muscles may be so great as to simulate paraplegia, and you will see the patient dragging himself painfully along with the aid of a staff, the legs spread well apart, toes pointed down, and the feet striking the ground with a flap. Wrist-drop is as pronounced as in lead palsy. With all this paralysis the man does not seem very sick, he eats pretty well, and has control of his bowels and bladder.

The heart is very apt to be affected, and on the slightest exertion you will find palpitation, increased area of pulsation, and a quickened pulse. Combined with these symptoms is increased area of dulness, murmurs, and changed rhythm.

The other type is equally striking in appearance. The dropsical cases are as swollen as the atrophied are shriveled. There is general edema; face, body, legs, and arms are all puffy and distended. There may also be ascites and effusion into the chest and pericardium. When the dropsy is so extensive there is very commonly cyanosis and dyspnea. The patient is generally confined to his bed, but you will find on examination that there is paralysis and ataxia present. While the digestion may not be much impaired, the urine will be scanty. Examination of the chest will show an involvement of the heart quite similar to that in the atrophic form.

In still another set of patients will be found a mixed set of symptoms, including the atrophic and paralytic symptoms, accompanied with some edema. In my experience this is perhaps the most frequent class of cases seen.

Provided the nerves are not too seriously affected there may be complete recovery, such as you find in postdiphtheric neuritis, but very often death may suddenly occur from collapse due to cardiac paralysis. It happens, too, not infrequently, that the patient may recover a fair state of health, but be left with an enlarged heart or atrophied limbs.

Pathology.—The clinical symptoms of beriberi are due to the direct action of the poison upon the peripheral termini of the nerves. Certain nerves are peculiarly liable to be attacked —the musculocutaneous of the legs, the branches of the sciatic, which supply the legs and thighs. Later the nerves of the upper extremity and of the face are affected. It is more unusual to find any involvement of the nerves supplying the muscles of the trunk, the intercostal and diaphragm. The larynx is quite often affected, and occasionally hearing and sight are lost. The poisoning of the nerves causes the paralysis of sensation and motion which always exists, provided the patient lives more than a few hours.

The virus of beriberi very often attacks the nerves of the heart, both the branches from the vagus and sympathetic system. The edema is probably to be explained by the paralysis of the nervi vasorum, and it is interesting to note that the edema occurs first in front of the legs, over the muscles which are earliest affected with paralysis.

Fatty degeneration of the myocardium and the voluntary muscles, due to the action of the virus, and subsequent neuritis are constant appearances in chronic cases.

Dr. Hamilton Wright describes a gastroduodenitis occurring in acute cases attended with

congestion of the mucous surface and the presence of the bacilli.

There is often congestion of the liver, kidneys, and spleen, but no very characteristic pathological changes are generally present aside from the degenerations of the nerves and muscles.

Prognosis.—The prognosis of beriberi varies greatly according to the type and locality. Acute cases always die. Subacute cases rarely die, but there may be considerable mortality in chronic cases, both from the disease and from intercurrent affections.

The prognosis depends mainly upon the extent to which the heart is involved. So long as this organ is not much damaged the prognosis is good, even when the paralysis and other symptoms are severe. Another symptom quite as unfavorable as those coming from the heart is paralysis of the diaphragm due to implication of the phrenic nerve.

While in Japan the mortality does not exceed 4 to 5 per cent, in Brazil it has been as high as 50 to 60 per cent. In the outbreak in the Tuscaloosa Insane Asylum the mortality was about 30 per cent.

The diagnosis of beriberi in a country where the disease is prevalent does not present much difficulty in the subacute and chronic cases, but in the acute cases death has often occurred unexpectedly when the cause was not suspected, as the paralysis and edema may not be at all marked.

Among whites in the tropics many cases of alcoholic neuritis are called beriberi, and there may be some difficulty in diagnosing between the two affections, but in alcoholic neuritis the edema and heart complications are absent.

I have seen a case of acute nephritis with cardiac complications wrongly diagnosed as beriberi, but the examination of the urine soon corrected the error.

Treatment.—As Scheube says, there is no specific cure for beriberi, but much can be done for the patient.

All recognize the importance of removing the sick man from the place where he contracted the disease, and if possible from the locality or district. If cases occur on a ship they should be sent on shore, and those developing on land should be removed to a high, well-ventilated situation, and as soon as possible be sent to a cooler climate.

Salines are probably more generally given than any other class of drugs, especially at the onset of the disease, sulphate of magnesia or soda being given in sufficient doses to move the bowels thoroughly. They do relieve the constipation and reduce the edema.

For those cases in which the heart is affected, and they include the large majority of all you meet, digitalis, I believe, is the best drug to be used. It steadies and strengthens the heart and also relieves the edema better than any other agent. You can combine it with a diuretic, as acetate of potash, and the results are often very satisfactory.

In the acute cases in which there is great cardiac insufficiency, as shown by the rapid, feeble pulse, violent palpitation, dyspnea, and cyanosis, I have taken 10 to 12 ounces of blood from the arm, and repeated it after some hours. It gives great relief to all the symptoms even if they recur later. This form of treatment has been much used in Japan, and is highly recommended. In chronic cases electricity is a useful application to the paralyzed muscles, and both the faradic and galvanic currents are used. It should be employed only in the later stages when the acute symptoms have subsided.

Strychnine, arsenic, iron, and other tonics are useful, but probably exert only a general effect in improving the strength of the patient. The usual attention should be paid to the diet, which should consist of easily digested nutritious food containing a liberal amount of nitrogen.

Rice is a poor food for a beriberi patient, while beans are much thought of in Japan.

Prophylaxis.—I will close this rather lengthy article with a few words as to the prophylactic measures to be adopted when the disease appears on a ship or in an asylum, or when a district seems to be infected.

When cases have appeared on a ship, as careful disinfection should be practiced as in the case of other infectious diseases. Especial care must be given to the disinfection of the sleeping quarters by the use of formaldehyde, sulphur, and other agents. All bedding, clothing, and bunks should be as carefully sterilized as in an outbreak of plague. The sick should be removed from the ship, if possible, and if this is impracticable they should be isolated on deck and their stools disinfected, as there is a possibility of their containing the pathogenic germs.

If an outbreak occurs in a prison or an asylum, we should consider the apartments infected which the sick have occupied. There should be the most thorough disinfection of these rooms by cleansing, scraping, and the use of suitable disinfectants.

I recently learned of an outbreak at Bilibid prison in Manila, which has between 2000 and 3000 inmates, who are housed in many separate buildings. One building became infected, and many of the occupants were attacked. All the ordinary methods of sanitation and change in diet were of no avail, until the building and all its contents were most thoroughly disinfected, when the outbreak ceased. Similar cases have been recorded so often as to leave no doubt that a building or even a single story may become infected. When a district or locality becomes infected the problem is more difficult. The houses should be built on high ground, if possible, with ample openings for light and air. The lower floor should be cemented so as to prevent dampness and favor thorough cleaning. The drinking-water and that used in the kitchen should be boiled and care taken to prevent the infection of food, cooking utensils, and table ware. It is highly probable that infection may be carried through the feces, and careful attention should be given to them so that the disease may not be spread. We should use very similar measures to those we employ with cholera and typhoid stools.

Treatment of Warts by Internal Remedies.—

Arthur Hall (*British Journal of Dermatology,* March, 1906) reports the case of a girl suffering from multiple warts, one hand and wrist containing as many as 367. No local applications were made, but a mixture of magnesium sulphate with sulphur was given three times a day for three weeks. Later the treatment was changed to a confection of sulphur and confection of senna, to be later followed by aloin and tincture of nux vomica. Under the latter treatment, which was continued for about one month, it was noted that the warts began to diminish in size and later nearly disappeared, a few remaining on the fingers. The writer previously reported a case of multiple warts on the scalp which had disappeared on the magnesium and sulphur treatment.

Iodine in Surgery.—

J. E. Cannaday (*Journal of the American Medical Association,* April 14, 1906) says that a 1-in-1000 solution of iodine is of great value as an irrigation in uterine sepsis, suppurative arthritis, abscess cavities, empyema, boils, small abscesses, and carbuncles. Of late he has used a one-half-per-cent solution of iodine for hand disinfection, the following formula being employed: Iodine 2.5 grammes, potassium or sodium iodide 5.5 grammes, water 250 cubic centimeters. Such a solution can be diluted and is very stable.

BOOK REVIEWS.

THE PSYCHIC TREATMENT OF NERVOUS DISORDERS. By Dr. Paul Dubois. Translated and Edited by Smith Ely Jelliffe, M.D., Ph.D., and William A. White, M.D. Funk and Wagnalls Company, New York and London, 1905. Price $3.00.

With the recognition of neurasthenia and hysteria as psychoneuroses it was inevitable that there should be a marked revolution in the treatment of these affections. Ever since the time of Beard there has been an increasing recognition of the mental rôle in these cases. For a long time the therapy was largely objective, devoted to the treatment of certain associated phenomena which were looked upon as the cause of the mental symptoms. For example, a morbid fear associated with dyspepsia called for gastric treatment. The physician in identifying the gastric symptoms concluded that he had arrived at the "cause" of the disease. Within the last few years there has been growing perception of the fact that many of the associated disturbances of the gastrointestinal tract and other organs in neurasthenia are not causes but are effects, the trouble being primarily mental. The recognition of this principle was bound to be reflected in therapeutics. The Nancy school believed that hypnosis was a valuable adjunct to the treatment, though it was recognized that suggestion might be made without hypnosis. The work of Dubois starts with the assumption that a large share of the neurasthenias and hysterias are psychoses pure and simple, and that whatever accompanying disorders are associated with them are secondary to the mental state. Starting with this assumption he has evolved a treatment, or as he delights to call it, a moral orthopedy. He does not neglect feeding and rest, but on the whole neglects drugs. Almost his whole reliance is on the reason of the patient. He shows him how the morbid fears and apprehensions produce symptoms, and convinces him by careful physical examination that they have no existence apart from the nervous disturbance which is due to the morbid mental action.

This in a nutshell is the claim of the writer. That it is founded on a rational conception of the psychoneuroses no one can question. This work of 466 pages is devoted to an elucidation of this doctrine. There is little doubt that the principles advocated by the author are correct and are destined to receive a wide application in the treatment of the psychoneuroses. One could wish that the work were a little less discursive, but notwithstanding this it is pleasant reading. He begins with a general elucidation of the position of modern medicine, and discusses the problem of liberty and determinism and the monistic conception. At first it would appear as if these had comparatively little to do with the practical management of neurasthenics, but the principles enunciated are carefully worked out in a chapter on the "Slavery of the Mind in the Presence of Certain Diseases." On reading the work it all appears so easy, but the practical application of moral orthopedics as found in this book will be found to be difficult, particularly in the general run of patients in private practice. In a sanitarium, where apparently most of Dubois's patients have been treated, it would certainly be more efficient than when the patients are seen only occasionally, as they would be in an ordinary ambulatory clinic. The principle advocated by Dubois is sound, and while other methods may reach equally good results it seems to us on reading his book that he has evolved the best principle. While in a way glimmerings of his method are to be found in the literature of the last twenty-five years, no one has stated them so succinctly and accurately, and we believe that no work that has recently been published dealing with functional nervous troubles is destined to make such an important change in the treatment of this class as the work of Dubois. The translating has been well done. No one who begins the book will fail to finish it, and will lay it down quite convinced that in the main the writer's propositions are correct and that he has added a most important chapter to the literature of the functional nervous diseases.

NURSING IN THE ACUTE INFECTIOUS FEVERS. By George P. Paul, M.D. Philadelphia and London: W. B. Saunders & Co., 1906. Price $1.00.

Of late years an extensive literature on nursing has grown up. The nurses' vade mecum of a few years ago was a single volume which was supposed to contain all that a nurse might wisely learn from print. Since then monographs on the nursing of different diseases have appeared: among the best and more important of these is this little work. In no department of medicine is nursing of more importance than in the acute infectious fevers. As a rule the diseases are self-limited, and treatment amounts to carrying the patient through the disorder. One of the most important factors in a successful outcome of the case is attention to the hygiene and the nursing. The book discusses fever in general under the head of diet, the alleviation of symptoms, and detection of complications. Nothing better

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has been said for a long time than the writer's chapter on ventilation. It is pointed out that if an abundant supply of air is necessary for a well person, how much more important it is for the sick. Not only should the expired air be gotten rid of, but an abundance of fresh air should be supplied. Attention is called to the vast difference between drafts and ventilation. The former is a source of injury, but the latter is necessary. A method of ventilating to avoid drafts by placing a board in the open window space is described and illustrated. This simple method of ventilation, practically costless, is one that should receive more attention. The words of Northrup should be impressed on every nurse, and for that matter every physician: "If you wish to kill a child who is sick with pneumonia close your windows, start the gas stove, burn a few gas-jets, have plenty of friends in the room to help use the air, and have the temperature of the room above 80°." In addition to the air being pure it should be moist, which may be done by hanging wet towels in the room. In diseases of the respiratory tract it is well to supplement this method by a steaming apparatus. The methods for the reduction of body temperature are fully considered and illustrated. Among the plates are those which show the use of the cold-water coil, the bed bath, together with a full description of cold packs. The remaining portion of the work is taken up with the nursing of the specific diseases. On the whole it is a valuable work and is an important contribution to the literature of nursing, and one that should be in the hands of every nurse who has to care for acute infectious disorders.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Gustavus P. Head, M.D. Vol. II, General Surgery, Edited by John B. Murphy, A.M, M.D., LL.D. Series 1906. The Year Book Publishers, Chicago.

This volume is one of the largest of this series of year-books, though it is bound uniformly with those that have preceded it. It consists of an excellent résumé of surgery for the year 1905. The volume contains 583 pages. We look forward to Dr. Murphy's summary in the introduction to the Year-book of the trend of surgical thought during the year. In this volume more than in those which have preceded it the abstracts are longer. This has necessitated the omission of much valuable literature, but that which is presented is given with greater satisfaction to the reader. Murphy says of technical procedures, which have largely held the front of the surgical stage for a number of years, that they have ceased to be of active interest, as the mortality from grave surgical lesions has been reduced to a minimum. There has been an increasing recognition that procedures must not only be life-saving, but that they must be free from pain and other discomforts. This statement is particularly applicable to gastric, biliary, intestinal, vesical, and genito-urinary surgery. Conservation of organs and tissues is rapidly supplanting the pan-operations of the past decade. Surgeons are becoming more exacting in their demands for better functional results and more uniform lines of practice. Surgery of the duodenum and its afferent ducts has attracted great attention, and much has been achieved. The results in gastric surgery are more uniformly good, and the lines of procedure clean-cut and generally accepted. Splenectomy results have been gratifying and have definite indications for their performance. Caution and conservatism in interference with or removal of secreting kidney structures are the significant watchwords of renal surgery. The greatest achievement in life-saving results has been in general septic peritonitis by limited operation and restricted manipulation. The lesson is being rapidly learned of early operation in appendicitis, cholelithiasis, and the value of curing a gastric ulcer by excision before it has had time to become cancerous.

The volume contains 29 plates, one of which is in colors, and 94 text figures.

INTERNATIONAL CLINICS. Edited by A. O. J. Kelly, A.M., M.D. Vol. I, 16th Series. The J. B. Lippincott Co., 1906. Price $2.00.

This exceedingly attractive quarterly comes to us containing a number of excellent articles, the first four of which deal with treatment of common conditions; the next four are devoted to medicine, five to surgery, two to obstetrics and gynecology, and one to pathology. This being the first volume of 1906 contains a departure from the previous issues in having a department of progress covering about 100 pages. The first, dealing with treatment, is by A. A. Stephens; the second, on medicine, by David L. Edsall; and the third, on surgery, by Joseph C. Bloodgood. The current volume is illustrated by a number of handsome plates, some in half-tones and others in colors. We shall not enter into an extended comment dealing with the contents of the volume, as a number of the more important articles will appear in the Abstract department of this journal.

THE WORLD'S ANATOMISTS. By G. W. H. Kemper, M.D. P. Blakiston's Son & Co., Philadelphia, 1905.

This little book of 78 pages gives a concise biography of the masters in anatomy from 300 B. C. down to the present time. The frontispiece naturally is a reproduction of Rembrandt's picture of Burgomaster Tulp's demonstration of the muscles of the forearm. Among the other illustrations are portraits of Winslow, Willis, Vesalius, Morris, Hunter, Holden, Heath, Harvey, and Dever. The brief sketches concern the men who have adorned anatomic literature. Among the names are

those familiar to every student, such as Sylvius, Steno, Eustacchi, and Broca. The author has performed a service to medical students in collecting this information. The history of medicine has ever a fascination for its students. The author says as one anatomist after another, dead and living, came up for study his enthusiasm grew upon him. In these brief pages much will be found that is pathetic, but perhaps none more so than the short reference to Bichat, who died at the early age of 31. In the short span of his life he contributed to medical science nine volumes, and it is said that in one winter he examined over 700 bodies. It may be said that this young enthusiastic worker founded general anatomical study. This little work of a few pages may be overlooked because of its unpretentious appearance, but it really represents much study and research upon a topic of surpassing interest to those interested in the history of medicine.

THE OPERATING ROOM AND THE PATIENT. By Russell S. Fowler, M.D. Philadelphia and London: W. B. Saunders & Co., 1906. Price $2.00.

So far as we are aware this is the only work devoted entirely to the preparation of the operating room and the patient, and which contains an accurate statement of the procedures for sterilization. It has been prepared by a surgeon of wide clinical experience, and is intended for the use of surgeons, nurses who assist at operations, and hospital internes. It clearly describes the preparation of material of all kinds, indicates the instruments required for the various operations, details the preparation and care of the patient before and after operation and the methods of anesthetization. The first chapter discusses the operating room and its personnel. The second chapter deals with the instrument and supply room, giving a list of what should be contained in such rooms and how they should be kept. The formulæ for various solutions are given, together with directions for the care of everything that is kept in the operating room. There is an excellent chapter on the various anesthetics, and also on the care of the patient before and after operation. The work has a good index, is adequately illustrated, and forms a splendid addition to the literature of modern surgical aseptic technique.

THE MEDICAL DISEASES OF INFANCY AND CHILDHOOD. By Alfred Cleveland Cotton, A.M., M.D. Philadelphia and London: J. B. Lippincott Co., 1906.

A new work on pediatrics from the pen of one who for years has been a teacher and practitioner in this branch calls for more extended comment than we are able to give it within the space of a short review. The first part of the work, dealing with the anatomy, physiology, and hygiene of infancy and childhood, is an amplification of the writer's previously published work on this subject. It contains the general principles of pediatrics, discussing the problems of growth, feeding, and hygiene. This is the most important part of pediatrics, and the one which entitles it to rank as a specialty. Part 2 deals with diseases as they are modified during the period of growth. The work contains 220 illustrations and is well issued by the publishers.

THE INTERNATIONAL MEDICAL ANNUAL. Twenty-fourth Year. E. B. Treat & Co., 1906. Price $3.00.

The current volume of the Medical Annual is equal to those that have preceded it, notwithstanding that part of the manuscripts were destroyed by fire. They were rewritten, and the volume brought out nearly on time. The Medical Annual is strictly a year-book of treatment which aims to present every improvement in medical and surgical science that has been made within the year. Every five years there is a synoptical index, which is a complete index for the five years of every advance in the treatment of disease. The volume is handsomely issued by the publishers and quite fully illustrated. A number of the plates are in colors.

ABSTRACTS.

THERAPEUTICS.

Treatment of Internal Hemorrhage by the Use of Drugs.—

Dixon, W. E. *Lancet,* vol. clxx, No. 12 of vol. i, p. 826, March 24, 1906.

Reference is made to the misunderstanding which prevails regarding the value of certain drugs in the treatment of internal hemorrhages. When it is possible to apply a drug directly to a bleeding point, the hemorrhage may as a rule be stopped with certainty by substances which coagulate proteid or which constrict the bleeding vessels. To the first group belong such remedies as the tannins and ferric chloride, and to the second group adrenalin and cocaine. When the drug must be absorbed and pass into the blood before it can reach the seat of hemorrhage, what happens to the bleeding vessel is not easy to determine. In studying the effect of remedies which are to be taken internally for the control of hemorrhage, it is necessary to know not only what becomes of the drug, but also how it acts as a vasoconstrictor. Suppose it to have reached the peripheral blood-vessel, it will not exert a greater constricting effect on the blood-vessel at the bleeding point than it will on others. If the bleeding vessel is poorly supplied with muscles and nerves, the effect on the other vessels may overshadow that on the bleeding vessel. The various tannins are not absorbed as such into the system—not more than one per cent reaches the blood in the form of gallate of sodium. This salt does not constrict vessels, hence tannin is useless in the control of internal hemorrhages. Adrenalin if administered by the stomach is inert, but if injected in small quantity into the circulation there is a decided rise in blood-pressure. There are several drugs which will cause vasoconstriction; adrenalin will do so when administered intravenously. Ergot, the digitalis group, lead, and other substances are effective when administered either by the mouth or subcutaneously. This vasoconstriction does not affect all the vessels in equal degree; some, because of defective nerve supply or the absence of muscular fibers in their walls, may remain unaffected. The lungs, liver, and brain have vessels which are relatively poorly supplied with muscular tissue, while the splanchnic area has vessels with a relatively good supply. The general rise of blood-pressure due to constriction in the splanchnic area may overcome the feeble constriction in the lungs, liver, or brain. Adrenalin has a decided action on the heart. Under its influence the pulsations are increased in number and in vigor. Animals poisoned by toxins live under the influence of repeated intravenous injections, but they die immediately from cardiac failure after it is withdrawn. The powerful cardiac action of adrenalin is invaluable in tiding over an emergency, and it is one which has not yet received proper therapeutic recognition.

Ergot acting directly on the nervous system produces effects somewhat similar to intravenous injections of adrenalin. It causes constriction of the splanchnic and limb vessels, and it induces congestion of the liver, lungs, and meninges. As a heart tonic it has not received the attention which it deserves. Its effect is quite different from that of digitalis, and in some respects more effective. Ergot has a more prolonged effect on the circulation than adrenalin. Injections of ergot produce a more marked rise in systemic blood-pressure than that which can be obtained from the digitalis group. This increase of pressure is mainly

vasomotor, but is partly cardiac. The vessels which do not constrict are the coronary, cerebral, and pulmonary, so that the lungs and brain are congested and bleeding from them is certain to be augmented. Injections of ergot should be used for arresting hemorrhage only when the lesion is in some part of the splanchnic system. Squill is even more effective than digitalis and strophanthus as a vasoconstrictor, but its effects are much the same as that produced by ergot. The splanchnic vessels constrict and the pulmonary and cerebral dilate passively.

In conclusion the writer states that the tannins, adrenalin, digitalis, ergot, veratrin, barium, and lead are all useless in pulmonary and cerebral hemorrhages. It is most important that vascular pressure be not raised by increased cardiac action. Morphine, while it has no direct action on the heart or blood-vessels, quiets the nervous system, prevents excitement and the reflex rise in blood-pressure, hence it is probably of more service in cerebral and pulmonary hemorrhage than any other remedy. Another method of controlling the bleeding is to increase the coagulating power of the blood. The remedy for this purpose is chloride of calcium. In urgent cases the drug should be given subcutaneously; one or two grains in this way will diminish the time of coagulation in a healthy man to about one-half. It should not be forgotten that most cases of internal hemorrhage such as hemoptysis stop without assistance.

Simple Hydrotherapy in the Treatment of Chronic Nephritis.—

CROFTAN, A. C. *Medical Fortnightly,* vol. xxiv, No. 6, p. 143, March 26, 1906.

The reaction against drug therapy in kidney disease has possibly led to the neglect of ordinary physical methods in the treatment of chronic kidney disorders. Dietetic and medicinal means alone will not meet the indications in chronic nephritis. If the patient is fed on an exclusively milk diet there is great danger of underfeeding the subject and of flooding the stomach and cardiovascular apparatus with such large quantities of liquid that digestion is interfered with and the heart and arteries are subjected to a serious strain. If liquids are restricted and the patient kept on a dry diet the urine becomes too concentrated, and there is absorption of bowel poisons that irritate the kidneys. The continuous use of drugs has many inconveniences, as they sooner or later injure those organs that are concerned with their absorption and elimination, notably the stomach, the liver, and the kidneys. Drugs that are given for reducing vascular pressure or stimulating the bowel or skin have a transitory action, the organism soon becoming accustomed to them. If the patient is treated largely by hydrotherapeutic means, and if the diet has at the same time been properly regulated, then there are drugs to fall back upon in emergencies. As it is impossible to cure organic lesions of the kidney, treatment must be directed toward the secondary consequences that follow renal disease; the principle of rest must be utilized, for if the kidneys are spared the reparative processes can proceed unhindered toward the regeneration of diseased tissue, or there may be a vicarious hypertrophy of healthy parts. In recent years it has been learned that renal disease is frequently a secondary event resulting from a variety of primary causes. A newer conception of Bright's disease is that it is a chronic intoxication leading directly to high arterial tension, and later to a variety of nutritional disorders, first functional and then organic, involving chiefly those organs of the body that are supplied by end arteries. There is often involvement of the retina and brain when the kidneys are only slightly involved.

One of the most important elements in the

treatment of any form of chronic nephritis is the management of the cardiovascular conditions. It matters not whether these are looked upon as primary or secondary, for most kidney cases die from changes in the heart and arteries. Changes in the peripheral resistance can be brought about both by cold and by hot applications. In chronic arterial diseases the latter should have the preference, as cold at first produces a contraction of the peripheral vessels followed by dilatation. The primary contraction may in predisposed subjects produce a rupture of weakened vessels, and cold causes an increase of the heart's action, which tends to temporarily increase vascular pressure. In chronic nephritis the reaction may fail altogether, owing to a lack of vascular tone or changes in the heart muscles or those of the peripheral arteries. For reducing vascular pressure hot applications are the best, as they are more lasting. Heat if applied for a sufficient length of time produces dilatation not only of the cutaneous vessels but of the deeper blood-vessels. The fall of blood-pressure following hot applications is more permanent and there is less danger than when it is done by the application of cold. The simplest way of applying heat is to have the patient lie for five minutes twice each day in a tub filled with water a few degrees below the temperature of the body. The addition of a few pounds of salt to the water or immersion in warm carbonated water is useful, because the salt and carbonic acid assist in relaxing the peripheral capillaries. The bath-room must be kept warm, as the vascular tone is lowered in nephritic cases. To prevent hyperemia of the brain the head should be covered with cold cloths or an ice-bag. This plan not only reduces the blood-pressure, but slows the heart and reduces the force of its contractions. Moist heat should always be preferred to dry heat in the treatment of nephritis, excepting when it is desirable to get rid of edema. The dry heat abstracts so much water from the blood that the toxins become concentrated and more than compensate for any loss of solids by the skin.

In treating chronic nephritis it is important to allay nervous irritability. Unfortunately most hydriatic procedures that stimulate the stomach and bowels are cold, and hence cannot be used in chronic kidney disease. The one cold measure that is useful and can be applied with safety is cold to the liver, either in the form of a Priessnitz compress or the application of a cold stream of water directed over the liver and the rest of the body protected. This stimulates the hepatic function and promotes an increased flow of bile. The diuretic effect of cold on the kidneys is to be avoided, as it violates that prime necessity of rest for a diseased organ which is nature's method of restoring its structural integrity.

Iodine in the Treatment of Tuberculosis.—

Brown, G. A. *Montreal Medical Journal,* vol. xxxv, No. 4, p. 233, April, 1906.

The writer has employed iodine in the treatment of tuberculosis for some years according to a special formula. He was led to use it in this way because of its usefulness in tuberculosis in general, and also from the fact that the reputation which cod-liver oil has enjoyed in the treatment of tuberculous conditions was probably due to the action of iodine and similar substances. The solution employed by him is composed of precipitated iodoform, which contains 96 per cent of iodine, 100 grains; acacia powder, 125 grains; glycerin, 200 minims; carbolic acid, 5 minims; and boiled distilled water, 300 minims. The value of solutions of iodoform for injections into tuberculous joints has long been recognized. The writer contends that it is also useful in other tuberculous conditions, and that such injections have a constitutional action as well as a local

effect. The site chosen for the injection is the space between the left acromion process and the capsule of the shoulder-joint. The solution prepared according to the formula is sterilized, and the injection made with a syringe containing a metal piston which can be made surgically clean. After disinfection of the skin over the shoulder-joint, a point corresponding to the tubercle on the posterior part of the acromion process is located, and the skin just below it is frozen with ethyl chloride. The needle is inserted close to the bone and the solution slowly injected. The syringe should have a fine needle, and after the injection the arm should be fixed to the body and the part covered with sterilized gauze and a bandage. At first as high as 48 grains of the solution was given, but this was found to produce a severe reaction. Since then the quantity in non-pulmonary cases has been reduced to 12 to 24 grains, and in pulmonary cases from 8 to 12 grains. If the disease is extensive and there is much depression, smaller doses should be employed, repeated more frequently. Commonly 12 grains are employed every two weeks. Tonics should be used, and during the reaction following the injection it is well to give 10 minims of diluted phosphoric acid and strychnine phosphate 1-30 of a grain. In addition iodine may be given by the stomach. It does not disturb digestion, the solution being prepared so that each dose contains ½ grain of iodine, ¼ grain of potassium iodide, and 15 grains of alcohol, this quantity to be given in a half-tumbler of water between meals.

The subcutaneous injections of iodoform are painful, and apparently there is little result from them. The deep injections of iodoform are followed by a rise in temperature in the first twelve hours, and in ulcerated and tuberculous syphilides of the skin there is a marked change. The injection is followed by a leucocytosis which corresponds with the quantity of iodoform injected and the severity of the reaction. There is little change in the ratio of the different kinds of leucocytes. About the second week after the injection the appetite is increased and there is a corresponding improvement in nutrition, the patient gaining in flesh and becoming stronger, even when the disease is not completely checked. In pulmonary cases there is a rise in temperature according to the dose which lasts from four to seven days; after it subsides the temperature is normal. In other than pulmonary cases the rise of temperature does not last so long. A number of cases of joint tuberculosis, tuberculous glands, tuberculosis of the skin and of the lungs and bowels, are reported.

Treatment of Psoriasis.—

ABRAHAM, P. S. *British Medical Journal,* No. 2363, p. 842, April 14, 1906.

The writer discusses the etiology and prevalence of psoriasis as observed in the London hospitals. In the absence of definite knowledge of the pathology and causes of the disease the treatment must of necessity be empirical. In olden times internal medication was practically the only method irrespective of the baths which were used at watering-places. By degrees external medication came into vogue, and in Germany it was long the chief reliance. Patients have been cured, or perhaps what is not always quite the same, have lost their psoriasis, while under treatment by taking internal medicine alone. But this does not prove it to be a constitutional disease any more than its disappearance under local applications proves that it is a local disease. In the writer's experience external applications have been most efficacious. The eruption always disappears under tarry applications adequately used, and still more rapidly and certainly under chrysarobin, whether other medicines be given internally or not. Associated complications such as indigestion

and debility must be met by internal treatment, while at the same time external treatment is vigorously pushed. Arsenic has been long looked upon as a specific in psoriasis, but as early as 1893 the writer expressed doubts as to the efficacy of the arsenic treatment in this disorder. His subsequent experience has strengthened this opinion. That arsenic may be useful, particularly in cases of neurotic patients, acting as it does as a nerve tonic, is easily understood. Under large doses of arsenic the eruption may temporarily disappear, but a similar result is not infrequently observed during some intercurrent disease. Anything which profoundly alters the general nutrition of the system will at the same time affect the skin and its efflorescence, and the latter may vanish for the time. After Bramwell's publication of three cases treated by thyroids the writer employed it in 65 cases. In only a few was marked improvement noted. In considerably more than half the cases the results were either negative or the eruption actually increased while the thyroid was being administered. The salicylates are often useful in those with a rheumatic tendency.

In treating the cases locally the parts should be thoroughly soaked for ten minutes in a weak tar bath every day, to be followed by a copious inunction with some tarry ointment. It matters little what particular tarry substance is used, but creolin from gas tar is convenient and quite as good as any. The tar bath is composed of one drachm to six gallons of water. After the bath indurated patches, especially on the external surfaces, are thoroughly rubbed with the following:

℞ Creolini .....3j to 3ij.
Acidi salicyl. .....gr. x.
Hydrarg. ammon. .....gr. x.
Lanolini,
Vaselini .....ää q. s. ad ℥j.

The proportions of the ingredients must be diminished or increased or some left out in accordance with the special circumstances of the case. Most cases yield to this treatment in a few weeks if copiously and thoroughly applied, but when progress is slow 10 or 20 grains of chrysarobin is added to the above ointment where patients can be carefully watched. Out-patients and those seen in private practice should have the obstinate patches rubbed with a stiff brush dipped in chrysarobin dissolved in benzine, after which the parts are painted over with flexible collodion. For psoriasis of the scalp the routine treatment for a few weeks is:

℞ Hydrarg. ammoniati .....3j.
Saponis mollis,
Vaselini .....ää q. s. ad ℥j.

With the addition sometimes of resorcin or some tarry oil.

Treatment of Tenia.—

FOWLER, J. K. *British Medical Journal,* No. 2363, p. 841, April 14, 1906.

The treatment recommended is a modification of the ordinary use of male-fern. The procedures formerly in vogue in the out-patient department of the Middlesex Hospital frequently failed, but since it has been the custom to admit these cases to the wards success has become the rule. On admission the patient is put to bed and is kept there two days, and in some instances three or even four days. The diet is reduced to beef tea two pints, Mason's essence one tin, two rusks, and port wine four ounces. During the same period the patient takes a tablet of cascara sagrada three times daily. On the fourth day, usually at 5 A.M., haustus sennæ co. 1 ounce is given at 5 A.M. and at 9 A.M. a capsule containing 15 minims of the extract of male-fern, which is repeated at 9.15, 9.30, and 9.45, and at 11 A.M. a second draught of the senna is given. If by 1 P.M. the worm has not been passed and the head found a second course of treatment with male-fern at intervals of 15 minutes is begun, to

be followed in an hour by a purgative draught. If the head is not found a third course of treatment is prescribed. It is not advisable to continue the treatment beyond this without an interval of a day, as it is somewhat exhausting.

This method of treatment differs from that usually employed, in that the patient is kept in bed and the period of fasting is prolonged. This insures that the bowels are nearly empty when the teniacide is given. To facilitate finding the head, as it is usually separated about one and one-half inches from the head, the pan in which the movement is passed is covered with black crêpe. Against this the fine white filament terminating in the head is more readily seen. In 17 cases out of 22 the head was found, and in two of the remaining cases a cure was certainly effected. The other three patients were lost sight of, though it is probable that they were cured, as they had been instructed to report if segments of the worm were passed. In 21 of these cases the variety of worm was the *Tænia mediocanellata,* and in one the *Bothriocephalus latus.* So far as these cases go they show that contrary to the usually accepted belief the male-fern is efficient in getting rid of *T. mediocanellata.*

Potassium Iodide in Senile Epilepsy.—

McDougall, A. *Medical Chronicle,* vol. xi, No. 1, p. 12, April, 1906.

The case is described of a man 75 years of age, who had his first epileptic seizure in June, 1904. At the time he was sitting and reading, and it was accompanied by an aura which extended from his stomach to his head. With his first seizure there was no dizziness and no loss of consciousness. He was admitted to the David Lewis Colony for Epileptics in November of 1905. At that time he was having from one to four seizures a day, and they were not diminished under a daily ingestion of 30 grains of potassium bromide. Early in December the bromides were stopped and potassium iodide was substituted, giving 10 grains three times a day. This treatment was continued for a month, and during that time and for the next month there were no seizures. This patient was a strong, well-built, intelligent man, whose arteries were not palpable, and he presented no signs of organic disease. Apart from the seizures and a history of occasional slight attacks of dyspepsia he could be regarded as a healthy man. The seizures came on without much warning. He became pale, his face assumed a strained, anxious, or frightened expression. There were no movements of the limbs. So far as one could judge consciousness was not lost. The belief is expressed that the potassium iodide was beneficial in this case because of its effect on a possible arterial degeneration which was not demonstrable, and the patient looked young for his years. Occupation after he came to the colony, while it made the patient more comfortable, did not lessen the frequency of the attacks.

Mercury in Tuberculous Meningitis.—

Whitcombe-Brown, W. H. *Lancet,* vol. clxx, No. 12 of vol. i, p. 825, March 24, 1906.

The case described, in which recovery took place after the administration of mercury, occurred in a child of one year, and the symptoms began abruptly. Fever began in the afternoon, and the following morning the temperature was 104° F., with a quick pulse and rapid breathing. There was a statement that the child had been fretful for some weeks previously. By the middle of the second day there was improvement, the temperature falling to 101°. The second evening the temperature again reached 104°, and by the following day it was apparently a case of tuberculous meningitis. The temperature was still high, the child was semi-conscious, with sluggish

pupilary reflexes. There was apparently some rigidity of the muscles of the neck. On the third day of the illness coma was pronounced; the cephalic cry was evident; there was no vomiting; and she was apparently deaf and blind. There were no pupilary reactions. On the fourth day of the illness inunctions of mercury were begun combined with the administration of the bichloride by the mouth, together with iodide and bromide of potassium. From the fifth to the eighth day the child was in a critical condition, with occasional periods of collapse, after which improvement began. On the fourteenth day the pupils were reacting well, the child could hear and see, but was unable to move the limbs. On the fifteenth day the temperature dropped to normal, and was followed by a complete recovery, which took place about six weeks after the onset of the symptoms. The inunctions were continued for several weeks, a small quantity of mercurial ointment being rubbed into the nape of the neck and between the shoulders.

Treatment of Pruritus Ani.—

MACY, F. S. *New York Medical Journal,* vol. lxxxiii, No. 17, p. 870, April 28, 1906.

Attention is called to the necessity of individualizing the treatment and seeking for its underlying causes. It may be due to reflex or direct irritation of acrid vaginal discharges or to irritating secretions from the bowel. If such is the case these must be corrected. The ordinary local use of menthol, cocaine, and other lotions gives no permanent relief. Divulsion of the sphincter is unnecessary, as equally good results can be obtained from the use of as large a dilator as can comfortably be introduced. This should be employed immediately on retiring and retained for at least fifteen minutes. The treatment should be continued until the sphincter is considerably looser than it is intended ultimately to be. When there are nervous or infectious complications the treatment should be supplemented by introducing a tampon once daily after a stool, composed of 10 per cent ichthyol in glycerin if there is constipation, and in a lanolin menstruum if there is not. Relief immediately follows this treatment. The fissures heal and the chronic constipation is much benefited. The itching ceases with the insertion of the dilator; it recurs in the intervals between the applications, but is less severe and less frequent, until it disappears. It is seldom necessary to use local applications except when there are definite lesions. For these some astringent dusting powder or equal parts of fluid extract of hamamelis and the tincture of iodine may be employed. The parts should be frequently bathed with cold or even ice water, with or without the addition of an antiseptic. When the pruritus is so intolerable as to require immediate attention, a solution in water of bichloride of mercury 1 part in 500, applied ice-cold and immediately washed away, will give relief when other means fail. Menthol in alcoholic solution, 0.64 gramme in 30 cubic centimeters, is also useful. Such local applications are seldom necessary, as the insertion of the speculum or suitable dilator will often give immediate relief.

Adrenalin and Chloretone in the Treatment of Chronic Rhinitis and Pharyngitis.—

WARBRICK, J. C. *Therapeutic Gazette,* vol. xxii, p. 245, April 15, 1906.

For three years the writer has used with success solutions of adrenalin and chloretone in the treatment of chronic pharyngitis and rhinitis. He gives fifteen illustrated cases, the treatment of which is approximately as follows, though it is varied somewhat to suit the individual indications: The patients are required to come to the office daily for a few days, then every second day, and later once or

twice a week. The nose is first cleansed by an alkaline solution. Chloretone inhalant is then applied by spraying or inhalation from a nebulizer. A ready prepared and convenient inhalant (McClintock) is found on the market. Each 100 grains contain chloretone 1 gramme, camphor 2.5 grammes, menthol 2.5 grammes, oil of cinnamon 0.5 gramme, and refined liquid petrolatum 93.5 grammes. An oily solution of adrenalin is used in connection with the chloretone inhalant. This is obtained on the market under the name adrenalin inhalant, and is a much more useful preparation than any extemporaneous compounding of the drugs. A common method of treatment is to first cleanse the nares, then to spray the part with the adrenalin inhalant for the purpose of shrinking the hypertrophied mucous membrane, after which the chloretone solution is used for its antiseptic effect.

Treatment of Enuresis.—

Lewis, P. G. *British Medical Journal,* No. 2364, p. 903, April 21, 1906.

Attention is called to the widely varying views of the origin of this affection. The condition of the urine is admittedly abnormal in many cases; oftentimes the reaction is highly acid, and again strongly alkaline. Sometimes the specific gravity is high, and again low. The subjects of the complaint are decidedly abnormal. In many cases anemia is present. Trousseau regarded the symptom as essentially a neurosis, and by some it has been looked upon as a form of nocturnal epilepsy. In undertaking the treatment of a case it is necessary to consider (1) whether the case is simply one of general want of tone; (2) whether there is intestinal sepsis as a prominent feature, and if so the urine passed at night is abnormally acid and of diminished quantity, or of low specific gravity, alkaline or neutral, and of increased quantity; (3) or whether the case is simply one of habit remaining after the cause has been removed, or if improvemnt in the general health has become such that enuresis need not occur.

The first class of these cases need tonics such as iron and strychnine. Combined with these should be cold douches, massage, country life, and other things which improve the general health. The second class with their digestive disturbance should have careful attention paid to the intestinal tract. These are cases which are often easily cured by diet. In the acid form the elimination of meat alone may be followed by success, and in the alkaline form a non-farinaceous diet is often immediate in its good results. In the third class sources of irritation should be sought for, such as anal fissure, adherent prepuce, etc. In these cases moral orthopedics are also useful.

The limitation of the amount of fluid drunk never gave much benefit—in fact, it rather tends to aggravate than relieve the symptoms. Belladonna in small doses acts as a tonic, and may as other tonics succeed in the first class of cases. When given in semipoisonous doses it acts on the mind, and is then successful by diverting the attention. It may possibly make sleep less profound, and in this way the sphincter muscle will not so frequently lose control. Sedatives such as chloral and bromide may succeed for a time by blunting the nervous mechanism of micturition, but they do not relieve the cause and their use is unscientific.

Treatment of Whooping-cough.—

Le Fevre, R. E. *New York Medical Journal,* vol. lxxxiii, No. 15, p. 763, April 14, 1906.

Reference is made to the importance of prophylaxis, especially in the cases of young and feeble children. Hygiene is not to be neglected, and proper care should be taken of the sputa and excretions in general. The diet should be simple, digestible, and easily assimi-

lated. An abdominal binder is an important precaution against hernia during the paroxysmal stage. If the weather is moderately warm and moist there is no objection to the open-air treatment, especially if the catarrhal stage has subsided. Of the vast number of drugs employed none have proven to be specific. As a prophylactic and tonic during the continuance of the disease, the following prescription may be given:

℞ Quininæ tannatis .....gr. xxiv.
Olei theobromatis .....3vj.

M. Ft. trochisci No. xxiv. Sig.: One lozenge three to four times a day.

To modify the severity and relieve the frequency of the spasms during the paroxysmal stage belladonna and antipyrin may be given alone or in combination. The dosage of this prescription is for a child of from 2 to 4 years:

℞ Antipyrini .....gr. xij.
Tr. belladonnæ .....m. xlviij.
Syr. aurantii flor. .....fʒj.
Aquæ .....q. s. ad fʒiij.

M. Sig.: A teaspoonful every four hours.

When paroxysms are so severe and frequent as to disturb the sleep opium in some form or nerve sedatives may prove beneficial, such as hyoscyamus and cannabis indica. These should only be administered when necessary. Creosote is sometimes successful by inhalation, being vaporized over an alcohol lamp. It allays irritation, assists in the expulsion of mucus, and acts possibly as an antiseptic.

Formic Acid.—

STERN, H. *Journal of the American Medical Association*, vol. xlvi, No. 17, p. 1258, April 28, 1906.

Formic acid in two-drop doses well diluted occasionally causes irritation of the throat and a feeling of warmth and emptiness in the stomach. In five-drop doses it causes slight pharyngeal and laryngeal irritation. In ten-drop doses it has a mild diuretic and diaphoretic effect. In doses of from 3 to 4 cubic centimeters well diluted on an empty stomach it causes dryness of the throat, tinnitus, slight vertigo, burning sensations in the stomach, and sometimes mild pyloric spasms. These symptoms are accompanied by lassitude, moderate elevation of temperature, and in one-half to one hour by marked perspiration and diuresis. In 0.5 to 1 cubic centimeter, repeated three times a day for some weeks, it acts as a muscular excitant. No fatal case of formic acid poisoning is on record, but Lewin gives the lethal dose as one gramme of sodium formate to each kilogramme of body weight. The acid has a variety of uses; combined with iodine the writer has employed it in secondary and tertiary syphilis. It is useful in inoperable cases of cancer of the stomach, and seems to delay the fatal issue. Before the days of antitoxin it was the main reliance of the writer in cases of diphtheria. It has pronounced antiseptic properties.

Antistreptococcic Serum in Malignant Endocarditis.—

RAW, N. *Lancet*, vol. clxx, No. 16 of vol. i, p. 1103, April 21, 1906.

Attention is called to the fact that in most cases of malignant endocarditis the antistreptococcic serum has been abandoned. During the last eight years the writer has used this serum in more than 200 cases of septic infection of various kinds, and has come to the conclusion that in streptococcal infections the serum is of great value. The usual method of injecting the serum under the skin is open to objection, as it is painful and is frequently dreaded by patients. With a view to diminishing the discomfort he has employed the serum by the rectum in over twenty-five cases, and has found it so satisfactory that he will not again use it under the skin. The bowels are first cleared by aperients and the rectum washed with a little warm saline solution. Then 20 cubic centimeters of the antistrepto-

coccic serum mixed with 40 cubic centimeters of normal saline solution is injected into the rectum morning and evening. The serum is rapidly absorbed, and seems to exert the same bactericidal influence as when given under the skin. The writer uses a polyvalent serum, and with it obtains more definite results than with the simple serum formerly employed.

THERAPEUTIC BREVITIES.

Marmorek's Antituberculous Serum.—

A. Hoffa (*Berliner klin. Wochenschr.*, Feb. 19, 1906) has used Marmorek's serum for two years, having treated nearly forty cases of bone and joint tuberculosis, the most of which have been under observation for several months. Advanced cases with disorganization were not helped, but osteomyelitic processes in the early stages were arrested without other treatment than the serum. In many cases the serum had a favorable influence on the temperature, general state, and the local process. There was an especially favorable influence on resorption of abscesses. A local serum reaction was observed in one-third of the cases, but no permanent bad effects were noted, and in twenty-four hours all local signs of irritation had subsided. In the last six months the serum has been injected into the rectum. In this way it produces no local or systemic reaction, and the results are better than when it is given hypodermically, as it can be administered with greater regularity, and in larger doses.

The Vesicating Properties of Methyl Iodide.—

The *British Medical Journal* of March 31, 1906, quotes a report published in the *Répertoire de Pharmacie* from the pen of Dr. Causson, who claims that methyl iodide is a more powerful vesicant than cantharides. The observation is not new. As long ago as 1896 *Merck's Bulletin* contained the statement that methyl iodide is a vesicant that can be used in place of cantharides. Causson refers to it as a cleaner preparation, having the distinct advantage that it exerts no unpleasant effects on the urinary organs. In using methyl iodide 15 to 30 grains of the liquid is poured upon a double layer of bibulous paper cut to the desired size. The paper is then applied to the skin, which has been previously well cleaned. The paper is covered with gauze, the edges of the gauze being fastened to the skin by collodion. The dressing may be removed in two or three hours, or it may be kept in position from sixteen to twenty-four hours. Blisters commonly appear in from three to eighteen hours after the application and resemble those produced by cantharides.

MEDICINE.

Intermittent Claudication.—

FLINTERMAN, J. *Detroit Medical Journal*, vol. vi, No. 4, p. 113, April, 1906.

The case reported is that of a man 41 years of age, who complained of severe pain in his right foot with a sensation of numbness. The pain was aggravated by walking, though it was not absent when at rest. The patient was apparently healthy, and there was no disorder of the respiratory or circulatory organs. Sleep was broken by the more or less constant pain. The urinary examination was negative. The left leg has been amputated above the knee, and the right foot is somewhat flattened. The foot is sometimes hot, and again cold; when in a recumbent position the skin of the leg from the toes toward the knee is pale and dry. The leg does not perspire, and there is no hair below a line two inches from the lowest point of the patella. There is no apparent atrophy of the muscles. The knee reflex is absent and the plantar is weakened. When at rest sensation is normal. Electrical examination shows no

B. J. C.

degeneration of muscles or nerves. The superficial reflexes are normal. When the foot hangs down the skin of the foot, and especially the toes, becomes red, and after a while cyanotic. A white mark made by pressure disappears slowly. The cyanosis caused by the dependent position is accompanied by severe pain in the toes and foot. The nails are dry and have little growth. The skin covering the tips of the toes is cracked, showing some fissures. The heaviness and numbness and also sensations of heat and cold are increased by walking. If the patient persists in walking pain and weakness become so intense that he nearly faints, cold perspiration breaking out all over the body except on the right extremity. The muscles become stiff and contract after overexertion of the legs, and there is an especially painful contraction of the gastrocnemius.

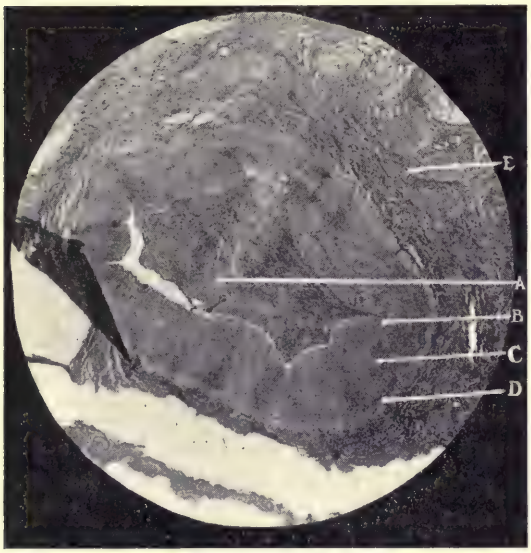

FIG. 1.—Cross-section of femoral vein, showing thrombus *in situ*. X 25. A, thrombus (mixed); B, tunica intima (thickened); C, greatly thickened tunica media; D, tunica adventitia; E, connective tissue.

Thirteen years ago the patient was sent to Mt. Clemens on a diagnosis of rheumatism. Some relief was experienced, but after resuming his work the pain returned. Following the visit to Mt. Clemens a sore developed on the fourth toe, from which gangrene spread, necessitating amputation. First the toes were removed, and then an amputation was made below the knee, but a burning pain persisting, the leg was finally removed above the knee.

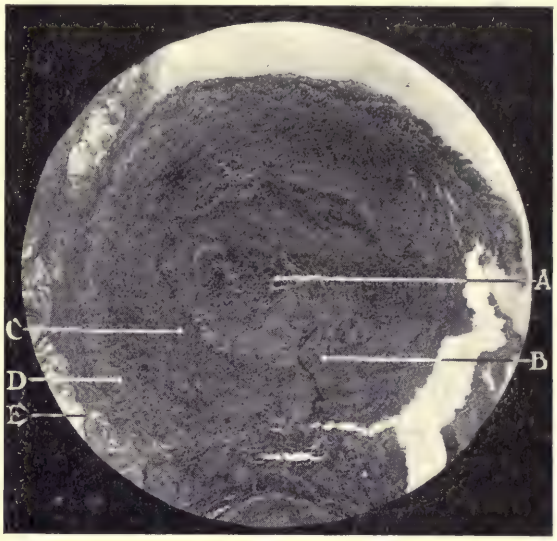

FIG. 2.—Cross-section of femoral artery, showing an obliterative endarteritis. A, organizing mixed thrombus; B, tunica intima; C, thickened tunica media; D, tunica adventitia; E, connective tissue.

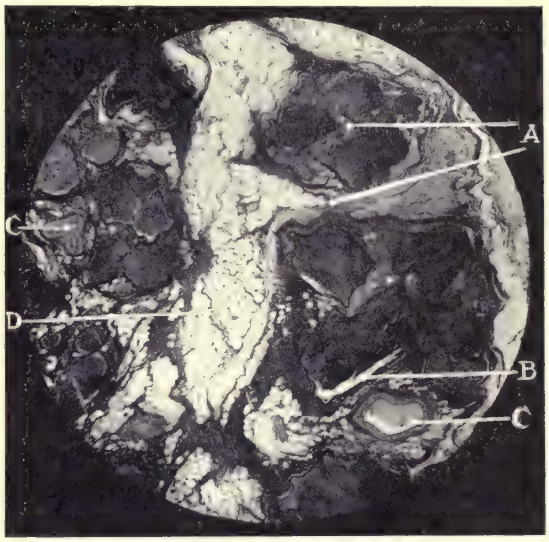

FIG. 3.—Cross-section of sciatic nerve, showing fibrosis. X 25. A, epineurium (greatly thickened); B, lymph-space; C, blood-vessels; D, perineurium (greatly thickened).

When seen in June, 1904, the pain in the remaining leg was excruciating, but there was no destruction of tissue nor any eruption on the skin. An ingrowing toe-nail called for surgical interference, which was followed by gangrene, necessitating amputation above the knee. At this time the skin covering the tips of the fingers was dry, there were small breaks in the skin, and the fingers felt numb. There were never general symptoms of arterial sclerosis. There was no history of lues. The patient was married when he was 18 years old and has two children, aged 20 and 18 years respectively. In early life he was exposed to severe cold and wet weather. It is probable that the disease began in the upper extremities.

An examination of the blood-vessels of the amputated leg showed an obliterating endarteritis.

Rupture of the Aorta.—

SMITH, C. A. *Northwest Medicine,* vol. iv, No. 4, p. 130, April, 1906.

Primary rupture of the aorta is a rare accident. The case recorded was that of a farmer 78 years of age. He was taken with a severe pain in the region of the heart. He fell, vomited, and was greatly prostrated. Nine o'clock of the same evening he was found sitting on the edge of the bed, in great pain, which was referred to the lower border of the ribs below the heart. It was aggravated by deep inspiration. No careful examination of the chest could be made, but apparently it seemed like a case of pleurisy. By the following morning the pain had again become severe, and the patient was very restless. There was great sensitiveness of the surface of the chest. While an examination was being made he suddenly cried out, fell back, and respiration ceased. In two or three minutes respiratory movements began; there was a restoration of the pulse, but the patient did not regain consciousness, dying at 1 P.M., about twenty-four hours after the severe seizure. It was learned that prior to the attack he had complained of distress in the left side for nearly a week.

At the autopsy, which was held the following morning, the tissues behind the sternum were found infiltrated with blood. The left pleural cavity contained more than a quart of blood and clots, the lung being compressed to a leathery mass. Above the heart was a thick clot in the tissues of the pericardium. The pericardial sac contained a small quantity of bloody fluid. Under the arch of the aorta, at the base of the left lung, there were dense clots. A rupture of the aorta was found opposite the opening of the left subclavian artery, about half an inch in length and semicircular in outline. The opening surrounded a slightly calcareous plaque. There were one or two spots in the aorta in which there was some softening. The writer believes that the distress of the preceding week was due to a breaking down of this degenerated area. The attack which finally resulted in death at the end of twenty-four hours was due to a rupture through the wall of the aorta, but the blood was confined by clots, which finally gave way the morning on which he died.

A Plea for More Thorough Examinations in Cases of Suspected Tuberculosis.—

KEELER, C. C. *Medical Record,* vol. lxix, No. 14, p. 542, April 7, 1906.

Attention is called to the suspicious symptoms which point to incipient tuberculosis, such as attacks of acute indigestion, chronic bronchitis, with or without expectoration, anorexia, dyspnea, slight or no rise in temperature, tachycardia, and little or no loss of flesh. A careful examination of such cases should be made even if but few of these symptoms are present. While not every patient afflicted in this way is tuberculous, yet it is in just this

class of cases that the early signs of tuberculosis are overlooked by the attending physician. Several examinations should be made on different days, and at different hours of the day. Considerable time should be devoted to palpation, percussion, and auscultation, the latter furnishing by far the most definite signs in early tuberculosis. Râles are never heard in the normal chest, and crepitant râles are infrequent in incipient tuberculosis. Localized areas of dulness at the apices and a lagging of the chest wall on movement which indicates some consolidation are valuable signs. The writer believes that the mortality of this disease can be reduced to a low percentage if physicians will spend sufficient time in the examination of suspected cases.

Studies in Yellow Fever.—

MARCHOUX and SIMOND. *Annales de l'Institut Pasteur,* vol. xx, No. 2, p. 104, Feb. 25, 1906.

The female *Stegomyia fasciata* during the first days of its perfect development is capable of sucking blood from human beings either in the daytime or at night. In a short time, usually after laying its first brood of eggs, it ceases to bite in the daytime. The result of this is that under normal circumstances the transmission of yellow fever rarely takes place between 7 A.M. and 5 P.M.

The ingestion of blood is indispensable for the development of the eggs of *S. fasciata.* In this it follows the general law applying to all of the culices provided with proboscides, verified upon all the species they have subjected to experimentation. Shortly after leaving the vessels the blood ingested by the insect loses the property of favoring the ovulation. In the greater number of mosquitoes the female dies after ovulation, and therefore is able to ovulate but once, but *S. fasciata* is an exception to this rule and can ovulate at least seven times after one copulation, provided it is able to ingest fresh blood prior to each ovulation. In the writers' experiments *S. fasciata* furnished at least three successive sets of eggs. This peculiarity of *S. fasciata* enables it to act as the vehicle for the spread of yellow fever.

It is easy to keep *S. fasciata* alive and to breed it in France. During the summer season the interiors of buildings, as well as the outside temperature, favor the mosquito, though it breeds less rapidly than in tropical countries. This shows the importance of establishing prophylactic measures against ships with yellow fever suspects arriving in port in the summer-time.

Human beings are susceptible to yellow fever at an early age. The malady develops in young infants in a discrete manner, and cannot certainly be diagnosticated except in the rare cases with blood vomit. There is scarcely any mortality from yellow fever during the first year of life, and the death-rate is low up to the period of adolescence. Masked cases can be observed at all ages, but are the rule in childhood. Such cases, however, confer immunity, the duration of which varies with the individual. They may be followed by future attacks. Recurrence in yellow fever is probably more common than is usually supposed, many cases escaping detection because of their benignancy. Exceptionally the disease occurs a second time in a grave form. Relapses are rare, and usually are exceptionally severe.

Anesthetics and Renal Activity.—

THOMPSON, W. H. *British Medical Journal,* No. 2360, p. 667, March 24, 1906.

This is an experimental study of the effects on the urine of narcosis with ether, a mixture of alcohol, chloroform, and ether, and a mixture of ether and chloroform. It was found that during ether narcosis the volume of urine secreted, as in the case of chloroform, is af-

fected in two ways. In the majority of experiments there is a decrease, in a few an increase. The latter is probably an early or light effect, and the former a pronounced effect. The depressing effect on the urinary excretion is more marked than with chloroform, and complete arrest more readily occurs. The after-effect is also similar to that of chloroform, but as a rule less marked. The maximum outflow of urine occurs about three hours after removal of the anesthetic. The effect of ether on the output of nitrogen corresponds more closely with its influence on the outflow of urine than is the case with chloroform. In the later stages of the anesthesia, when the volume of urine is decreased the excretion of nitrogen is diminished to the same degree as the volume of urine. The effect of ether narcosis on the concentration of the urine differs also from that of chloroform. With the former the urine when diminished in volume is as a rule more concentrated. The converse was the case with chloroform. The effect of ether is primarily vascular. In ether narcosis, when the curves of urine outflow, kidney volume, and blood-pressure are compared, although there is not complete parallelism there is on the whole a closer correspondence than is the case with chloroform. This statement does not apply to the arrest of urinary secretion, which occurs more readily and with relatively higher blood-pressure in ether than in chloroform narcosis. The escape of leucocytes into the urine after full ether narcosis is more marked than with chloroform. Temporary albuminuria appears in dogs in a much larger proportion of experiments with ether than with chloroform.

With the alcohol, chloroform, and ether mixture the outflow of urine is diminished, but there is a less degree than with either chloroform or ether. The excretion of nitrogen is less depressed than the volume of urine. The effects on the nitrogen excretion with this mixture alternated between those of chloroform and ether.

The effects of a mixture of ether and chloroform on the kidneys resembled that of ether alone.

The Psychology of the Tuberculous.—

GUBB, A. S. *Lancet,* vol. clxx, No. 9 of vol. i, p. 594, March 3, 1906.

Prolonged observation of a number of tuberculous patients has convinced the writer that this disease has a well marked influence on the mentality. In certain instances when the disease appeared to be latent the psychical changes continued their evolution until there was an explosive recrudescence of the tuberculous process. Clinically it is possible to divide these into two groups: (*a*) Changes of temperament presumably due to the action on the nervous system of the toxins elaborated by the tubercle bacillus; and (*b*) modifications of character due to mechanical interference with the cerebral functions secondary to the deposit of tubercles within or upon the brain. A separation of these two causes may be only possible by a post-mortem examination. The chief feature in the psychology of the tuberculous is instability. Feverish activity followed by periods of depression, despair giving place to plans for a distant future, hypochondria from which relief is sought by intense application to work or indulgence in sensual pleasures. There is exaggerated idealism, with a tendency to sentimentality and intensification of the cerebral function. During the stage of invasion there is a noticeable tendency to refinement, both physical and mental, and under its influence the artistic and imaginative faculties are often stimulated. The tendency to take a sanguine view of things becomes more marked as the disease advances.

When a patient first learns that his lungs are affected he usually displays great anxiety

and is depressed. The depression gradually subsides, until at the terminal period the victim obstinately makes plans or initiates enterprises inconsistent with the brief span of life remaining. In most cases of pulmonary phthisis the patient is buoyed up by a hope that defies contradiction. Patients often throw themselves into tasks with a zest which is often assumed to be the cause instead of the result of the tuberculous process. Confirmation of the writer's views on the psychology of phthisis is found in Mauclair's study of Watteau. He claims that the latter's transcendental delicacy of perception and execution was begotten of tuberculous intoxication. The same is to be noted in Schubert, Novellis, Chopin, Verlaine, Heine, Mozart. It is not to be inferred that there was nothing morbid in their achievements, the phthisis merely accentuating a natural predisposition to idealism.

Cerebral Paralysis.—

BROWER, D. R. *Journal of the American Medical Association,* vol. xlvi, No. 13, p. 939, March 31, 1906.

The writer discusses the statistics of the Chicago Health Department, which show that there is a marked decrease in the number of deaths from cerebral paralysis during the last two decades. This corresponds with the decrease of the nervous diseases generally, indicating that the population is adapting itself to the strenuous conditions of modern life. The positive diagnosis in a given case between hemorrhage, thrombosis, and embolism should be made with great caution. A valvular heart disease does not forestall the possibility of either hemorrhage or thrombosis. The specific relations of arterial degeneration are too often overlooked, especially in the younger patients. Attention to the preservation of the function of the paralyzed muscles is important in cases of cerebral palsy. He advises the use of mild cerebral galvanization, using a current of from 1 to 2 milliamperes, the positive pole at the head and the negative at the nucha, for five minutes daily, together with mild faradic exercise of the muscles. The possibility of reëducation of the speech in aphasic cases should always be kept in mind.

Function of the Left Prefrontal Lobe.—

PHELPS, C. *American Journal of the Medical Sciences,* vol. cxxxi, No. 3, p. 457, March, 1906.

As early as 1894 the writer called attention to observations which suggested that the intellectual faculties were largely confined to the frontal lobe. In 1897 a series of intracranial injuries were recorded which tended to support this contention. Further observations were reported two years later. From these, and including his later work, he comes to the conclusion that three propositions may be regarded as final: (1) The more absolutely the lesion is limited to the left prefrontal lobe the more positive and distinctive are the symptoms of mental defect. (2) The mental faculties remain unimpaired with right frontal lesion, even though it involves the destruction of the whole lobe or the entire right hemisphere. (3) The exceptional instances in which seemingly opposite conditions exist are always reconcilable, on more careful examination, with the assertion of an exclusive control of the mental faculties residing in the prefrontal region of the left side.

A Three-glass Catheter Test.—

WOLBARST, A. L. *Medical Record,* vol. lxix, No. 16, p. 627, April 21, 1906.

The writer describes an ingenious method of identifying the origin of certain discharges from the urinary tract. The anterior urethra is first washed carefully until the washings come out clear. These are placed in glass No. 1, which shows the condition of the anterior urethra. A soft, sterile catheter of small caliber

is then passed into the bladder, and the bladder contents are drawn off into glass No. 2. This shows the bladder urine plus possible drippings from the posterior urethra or anything carried into the bladder by the catheter. The bladder is then washed out thoroughly until the washings become clear. This shows that the bladder is empty of all pus or shreds. Then about eight ounces of clear fluid is injected into the bladder and the catheter is withdrawn, the anterior urethra and the bladder having been previously cleansed. If the patient now passes the fluid into glass No. 3 this shows the condition of the posterior urethra. In this way separate urines from the three portions of the urinary tract may be obtained. A further extension of the method would be to use a fourth glass, into which a couple of ounces of fluid is passed after a massage of the prostate.

Relationship Between Graves's Disease and Acute Rheumatism.—

ROBINSON, W. E. *Lancet,* vol. clxx, No. 15 of vol. ii, p. 1037, April 14, 1906.

The writer gives an account of a case of Graves's disease which began with a rapid heart, pulsations in the neck, and later developed the typically prominent eyeballs and enlarged thyroid of Graves's disease. During the progress of the disease the patient developed a tonsillitis and an iritis, the latter persisting for some time notwithstanding the free administration of salicylates. Later there was joint trouble. Both parents gave a family history of rheumatism. In analyzing the statistics of Guy's Hospital it was found that there were 127 cases of Graves's disease admitted, and of these 18.9 per cent gave a definite history of rheumatism, and in 9.45 per cent there was a history of acute rheumatism in the family. Greenfield called attention in the Bradshaw lectures of 1893 to the association of acute rheumatism and Graves's disease, and the same connection was noted by Fagge and Bramwell.

SURGERY.

The Office Treatment of Anal Fissure.—

GANT, S. G. *Medical Record,* vol. lxix, No. 17, p. 656, April 28, 1906.

Fissure in ano is defined as an elongated rent or ulcer of the mucosa at its juncture with the skin. It is invariably accompanied by pain. The lesion is parallel with the long axis of the rectum, and it is usually single and most often located at the posterior commissure. In reference to causation there are two types of fissure, one due to tearing of the mucosa and the other to detachment of a semilunar valve. In recent fissure the edges are clear-cut, not sensitive, and there is frequent bleeding and comparatively little pain. A chronic fissure is accompanied by sharp pain and severe spasm of the sphincter. When exposed the ulcer is found to be exceedingly sensitive, and the edges inflamed, thickened, and rounded. There is sharp pain after every defecation, and not a dull, agonizing pain, which may be continuous or only subside after many hours. The discharge from a painful ulcer is not abundant, but it is sufficient to irritate the anal region. The fissure can usually be brought into view by separating the margins of the anus, and in women this can be accomplished by everting the mucous membrane from the vagina.

Anal fissure is frequently improperly treated by divulsions and topical applications. More radical measures will cure them in a short time and with little suffering. A fissure of recent origin unaccompanied by sphincteralgia can be cured in most instances without recourse to surgical interference. The patient should be placed on a light diet and laxatives should be given. It is not necessary to stop work, but violent and prolonged exercise should be discouraged. The fissure should be wiped out after each stool. This can be effectively done by twisting a piece of cotton on the end of a wooden toothpick and dipping it in some anti-

septic solution. It can then be pushed into the rectum for about one inch and withdrawn through the fissure. This procedure causes only slight pain, and requires only rarely to be repeated. After it has been thoroughly cleansed topical applications of silver nitrate 10 per cent, ichthyol and glycerin 15 per cent, or balsam of Peru should be made by means of the toothpick applicator. Citrate of silver or calomel ointment may be applied twice daily. As a rule liquids are to be preferred to powders, as the latter sometimes cake and cause itching and pain. The applications should be continued until the ulcer has healed. As a general rule a

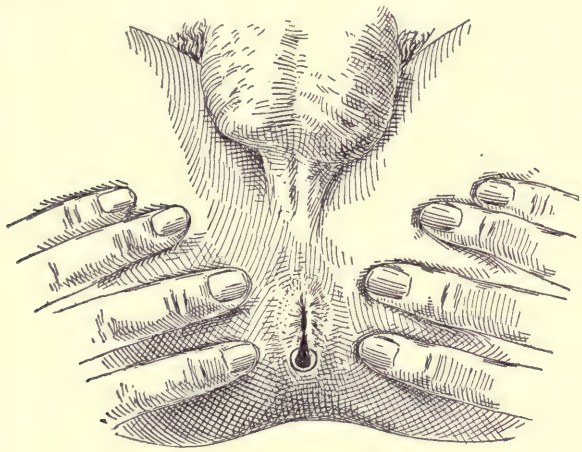

FIG. 1.—Showing fissure and sentinel pile.

chronic fissure or one which is accompanied by sphincteralgia requires surgical interference to effect a permanent cure. Where surgical interference is not permitted a cure can sometimes be made by stronger applications, such as ichthyol 50 per cent and balsam of Peru full strength. The pain of such applications can be minimized by applying a 10-per-cent solution of eucaine or cocaine before they are used. Caustics such as stick silver, copper sulphate, and like agents should not be used, as they cause intense pain, which may continue for hours after the application. When cauterization is resorted to it should be done by means of the galvanocautery after the fissure has been anesthetized by the injection into its base of a sufficient quantity of sterile water or weak solution of eucaine.

When surgical measures have to be employed

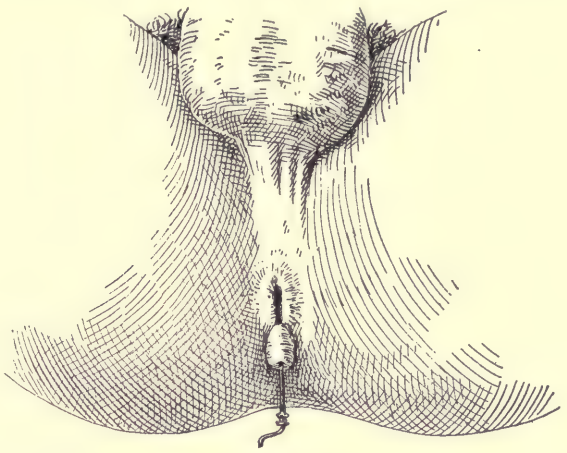

FIG. 2.—Showing swelling and blanching of the tissues caused by the solution, and also needle and Gant curved extension-piece used in making the injection.

it is no longer necessary for the patient to go to a hospital and have a general anesthetic. The operation can be done under local anesthesia. The spasm of the sphincter can be overcome by

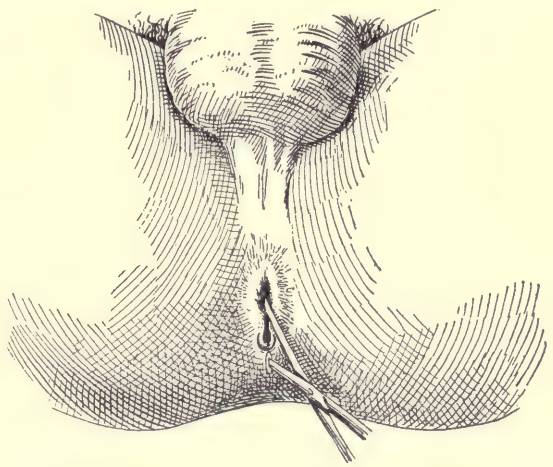

FIG. 3.—Showing scissors in position for dividing the sphincter and adjacent structures in the Gant operation.

incision and also by divulsion, but many cases will not be cured in which the latter method is employed, as the muscle regains its activity before the wound is healed. Division of the

sphincter is the operation of choice. In operating the patient should be placed on a low table in the lithotomy position or upon the left side with legs flexed upon the abdomen. A fold of skin in the median line one inch posterior to the anal margin is compressed between the thumb and forefinger to lessen the pain of puncturing. A syringe holding not less than an ounce of sterile water, or preferably one-eighth per cent of eucaine solution, has attached to it a needle which is inserted between layers of the skin, and a sufficient amount of the solution injected to produce a whitish swelling. The needle is successively advanced in the skin as the injection is made, producing an anesthesia up to the anal margin. It is then directed inward, and a sufficient amount of the solution deposited to form a firm, whitish tumor about the size of a pigeon's egg. The external sphincter and posterior rectal wall for a distance of one and one-half inches are now injected and anesthetized in a similar manner. In producing local anesthesia by this method it is not necessary to waste time in locating any particular nerve branches, as anesthesia is obtained when a sufficient amount of the solution has been deposited to produce edema. The only instrument required in the operation is a pair of scissors having one point blunt and the other sharp. The sharp-pointed blade is pushed through the skin in the median line one inch posterior to the anus. At the same time the probe-pointed blade is inserted through the anal orifice. The scissors are now pushed upward for a distance varying from one and one-half to two inches, after which with a single stroke all the tissues between the blades are severed. In this way a triangular wound is formed in the posterior median line two inches in length and one-half inch in depth, and includes the skin, subcutaneous structures, sphincter muscle, posterior bowel wall and tissues behind it. Skin tags or piles should be excised, and the wound lightly packed to prevent bleeding. The postoperative treatment is simple, and consists in cleansing the wound daily after each stool and inserting a piece of gauze loosely to act as a drain and keep the edges apart. After the first week the gauze is moistened with ichthyol or balsam of Peru to stimulate and increase the healing process. The patients are not confined to their rooms.

This operation is better than that of divulsion, and an improvement on excision and suture, as the latter is liable to be followed by infection. The operation is simple and effective, and can be painlessly and safely performed in the office. The operation has been performed by the writer 300 times without serious accident or complication, and in not a single instance has it been followed by unpleasant sequelæ.

Fractures of the Humerus by Muscular Violence.— ASHHURST, A. P. C. *University of Pennsylvania Medical Bulletin,* vol. xviii, p. 336, February, 1906.

Fractures produced solely by muscular violence are rare. Various diseases are known to affect the strength of bones, but they were all excluded in the cases collected by the writer. A case reported occurred in a man 33 years of age, who was throwing a baseball, and as it left his hand he felt a sudden pain in the right arm; there was an audible snap, and the arm dropped helpless. There was a fracture of the humerus just below the insertion of the deltoid muscle.

An examination of the recorded cases of fractures of the humerus by muscular violence shows that they are due to two main causes: First and most commonly to throwing a ball, and secondly to violent twisting of the lower end of the humerus while the upper end is held rigid. This latter mode of action is seen in the contest of strength known to the French as *le tour de poignet.* In this species of sport the two antagonists seat themselves at a table, on

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which they rest their elbows. Then each endeavors by grasping the other's hand to rotate his companion's arm outward and to bring the extensor surfaces of the forearm into contact with the table.

The writer has collected twenty-three cases in which the humerus has been fractured from throwing a ball. The explanations of these cases have been various, but it is probable that they occur in somewhat different ways. In the case which he reports the ball reached its destination, which would seem to imply that the throw had been made, and then that the force of the shoulder muscles in pulling the arm backward was sufficient to fracture the humerus. In some reported instances the ball dropped to the ground beside the player, the arm having broke just as the act of throwing was commenced. The fracture produced in this way is almost invariably transverse and below the insertion of the deltoid. In one case recorded there were two fractures, one below the surgical neck of the right humerus, and a second oblique fracture at the lower third.

The Painless and Bloodless Removal of Submerged and Adult Tonsils.—

KELLOGG, F. B. *Southern California Practitioner,* vol. xxi, No. 3, p. 112, March, 1906.

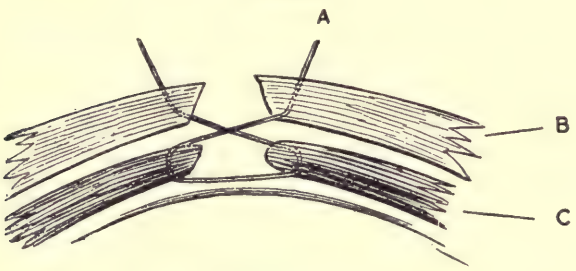
The operation proposed is a modification of Pynchon's galvanic cautery dissection. It is especially effective in the removal of a submerged tonsil, but has obvious advantages in the removal of adult tonsils of any class. The operation is useful in the removal of stumps of tonsils left after an ordinary tonsillotomy. The tonsils and pillars are first brushed with a 10-per-cent solution of cocaine to secure superficial anesthesia. A few drops of a mixture of beta-eucaine lactate 12 per cent and adrenalin 1 in 1000, equal parts, is then drawn into a Pynchon tonsil syringe. The needle is then passed into the middle of the membrane of the anterior pillar and a drop of the mixture injected into the membrane. Care must be taken not to penetrate the pillar. If the membrane only is penetrated a bleb will be raised by the injection. This is repeated above and below to cover the entire pillar. The anterior pillar is injected, as it is liable to be touched by the cautery, and is much more sensitive than the tonsil itself. After injecting the pillar the needle is plunged into the stroma of the tonsil in different places and a little of the mixture injected at each point. The tonsil after injection is pale and bloodless. The tonsil is then seized with a vulsellum forceps at the upper third and drawn out of its recess, and at the same time pushed slightly back toward the pharynx to put the attachments to the anterior pillar on the stretch. A galvanocautery knife at white heat is then entered at the top between the tonsil and the anterior pillar and passed downward, hugging the tonsil and separating it from the pillar. The tonsil is then drawn inward and forward, and the process repeated on its posterior aspect. At the upper part the cautery dissection is carried deeper, as it is important to completely separate the tonsil from the supratonsillar fossa. In this manner the tonsil is partially enucleated by the cautery. Instead of being a sessile body it is now pedunculated, simply being attached to its bed at the base. At this point the cautery is abandoned and the loosened tonsil drawn into the fenestrum of a Methieus tonsillotome and the enucleation is completed. A McKenzie tonsillotome would be equally efficient, and a wire snare would perhaps be better. It would be an additional safeguard against hemorrhage, although it would probably increase the reaction. The operation performed in this way is never followed by a secondary hemorrhage, and the primary hemorrhage is provided for by the adrenalin and the cautery. The operation may be used upon children as young as 10 years, and it is the proper treatment for diseased adult tonsils with a tendency to ulcerate in the crypts.

Suture of the Abdominal Walls.—

PIKE, J. B. *Lancet,* vol. clxx, No. 14 of vol. i, p. 967, April 7, 1906.

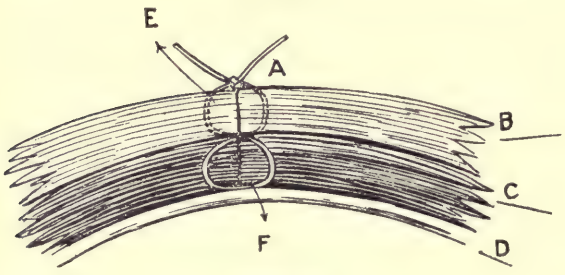
The persistence of troublesome sinuses after buried sutures of the abdominal wall has led the writer to devise a suture which has the merit of uniting the abdominal walls in layers, while at the same time the ends of the suture are brought through the skin. The peritoneum is closed by catgut, after which a moderately curved needle is threaded with silkworm-gut and passed through the skin and subcutaneous

FIG. 1.



Suture inserted. A, Suture. B, Integument. C, Muscle, &c. D, Peritoneum. E, Superficial loop. F, Deep loop.

FIG. 2.



Suture tied.

tissues. It is then carried through the muscles of the opposite side and back again through the opposite muscle layer, and finally through the skin and subcutaneous tissues on the opposite side of the incision. In this way a figure-of-eight loop is formed, the deep loop enclosing the muscular layer. The suture may also be readily passed by means of a thread with a needle at both ends. In this case the muscle layer is traversed on both sides from within outward, and the skin is punctured after crossing the suture to form the deep loop. The peritoneum can be included in the deep loop if thought desirable. By this method the edges of the incised skin are brought well together, and the effect in approximating the muscular layers can be judged by the outward traction on the free ends of the suture before tying. The writer has tried this method of suture in two cases, in one of which the wounds were septic, and the test was not a good one. The other was a clean case and the results were satisfactory. The sutures were removed on the tenth and fourteenth days. They came away with moderate traction and without much inconvenience to the patient.

Intranasal Surgery in the Treatment of Chronic Non-suppurative Affections of the Middle Ear.—

HARRIS, T. J. *New York Medical Journal,* vol. lxxxiii, No. 15, p. 756, April 14, 1906.

The writer reviews briefly the attitude of otologists in relation to intranasal disease. Sixteen years have passed since Daly read his paper on the relation of aural conditions to intranasal disease, and stated that there was a general neglect of intranasal surgery on the part of otologists. The general recognition of the interdependence of nasal and aural conditions has received increasing recognition, yet the separation of the two specialties is often marked, not only in hospital staffs but in the practice of physicians. He concludes with the statement that the nose plays an important rôle in many but not all cases of otitis media. The nasal lesion is usually obstructive, acting as an obstacle to proper ventilation of the middle ear. In beginning cases of hypertrophic otitis media a certain amount of improvement in the hearing can be confidently expected by securing proper ventilation, and in this way relieving nasal, pharyngeal, and tubal inflammation. Only cases which show pathological changes call for nasal treatment. It is important to

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determine the true nature of the process in the middle ear, as the so-called hyperplastic form is not influenced by intranasal treatment, and adhesive changes and ankyloses will not yield however completely the nasal obstruction is removed. Suitable cases can be helped, but there are many cases of chronic otitis media associated with certain nasal obstructions that do not call for and will not be improved by any form of nasal treatment. An important result often secured by intranasal treatment is the relief of repeated attacks of acute rhinitis, which by their effects on the Eustachian tube aggravate the chronic condition.

Pott's Fracture.—

McKenzie, B. E. *Canadian Journal of Medicine and Surgery,* vol. xix, No. 3, p. 146, March, 1906.

Plaster of Paris is regarded as the best dressing for a Pott's fracture. Attention is called to the necessity of adducting the foot and of maintaining it in that position. If this is neglected the result will be a tendency of the foot to roll outward, and a weakened, pronated foot will result. In adjusting this fracture inversion cannot be made too strongly, as the deformity cannot be overcorrected. As usually treated the lateral pressure applied is too slight to correct the deformity. If the foot be well padded in cotton strong pressure can be made by a plaster-of-Paris bandage. The cotton will yield enough to prevent undue pressure.

A Clinical and Anatomical Study of Resistant Forward Shoulders.—

Fitz, G. W. *Boston Medical and Surgical Journal,* vol. cliv, No. 16, p. 423, April 19, 1906.

The writer gives a careful anatomical study of the condition of forward shoulders, and comes to the conclusion that it is associated with certain anatomical conditions. The commonly accepted statement that tight pectoral muscles are the cause is not tenable. The most common cause in forward shoulders is the tightness of the serratus muscle. An occasional factor usually associated in extreme cases with serratus contracture is shortness of the coracoclavicular and acromioclavicular ligaments, whereby the union of the clavicle and scapula is so rigid as to prevent full backward and downward movement of the shoulder. A systematic examination of forward shoulder cases is necessary to identify the causes which restrict motion. The early recognition and treatment of these cases is important, as improvement by self-correction is unusual. In some cases stretching and muscular development will fail, and in these it is necessary to incise the coracoclavicular ligaments. The term "round shoulders" is misleading. The term forward shoulders is far more definite, and should be accompanied by a statement of the causes which lead to it.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

A New Instrument for Measuring All the Diameters of the Pelvis in the Living Woman.—

Jacobson, S. D. *Medical Record,* vol. lxix, No. 13, p. 489, March 31, 1906.

The writer discusses the literature of pelvic measurements. This he summarizes as follows: (1) Under ordinary circumstances the normally sized and shaped maternal pelvis is the main obstacle to the delivery of the normal fetal head at term. (2) The maternal pelvis is rather frequently contracted in one or more of its diameters. (3) If the pelvic contraction is slight spontaneous or instrumental delivery may take place without injury to either mother or child. (4) If the contraction is of greater degree, delivery of the child by instrumental aid will be necessary, and in the highest grades of pelvic contraction delivery through the natural passages is impossible. (5) The size and

build of the woman afford no criterion as to the size and shape of the pelvis. (6) On the exact degree of contraction will depend the choice of method of delivery, or the choice of a number of different operations. (7) It is essential to measure accurately the pelvis, but thus far all methods amount to little more than inaccurate attempts at guessing. The instrument which he has devised it is claimed will enable the physician to measure easily, rapidly, and accurately all the important diameters of the pelvis in the living woman. With it the shape of the pelvis can be determined and the presence of abnormalities, such as callus, tumor, or deformity, can be noted.

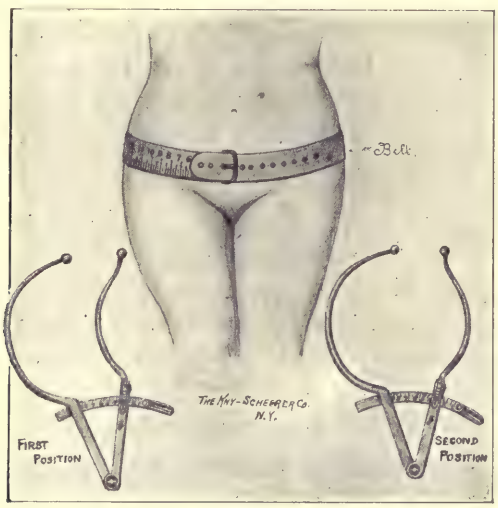


FIG. 1.

The instrument is constructed of steel and has two branches hinged in the form of calipers —the outer or semicircular branch, and an internal S-shaped branch. It has a movable gauge, and the instrument can be set by a thumb-screw. The removable branch is attached to the handle by a pin and socket, which is further secured by a sliding clip. The upper ends of the branches are ball-pointed and can be separated about twelve inches. A leather belt accompanies the instrument, which is graduated in inches, halves, and quarters, beginning at the bottom and reading from right to left (Fig. 1). The internal branch of the instrument is likewise graduated from the ball downward. In employing the instrument the bladder and rectum are first emptied, and the patient is placed on the left side upon a table and the knees drawn up. The belt is fastened around the hips so that the end of the buckle is just over the symphysis pubis and exactly in the median line. The belt should pass posteriorly at about the center of the sacrum and is

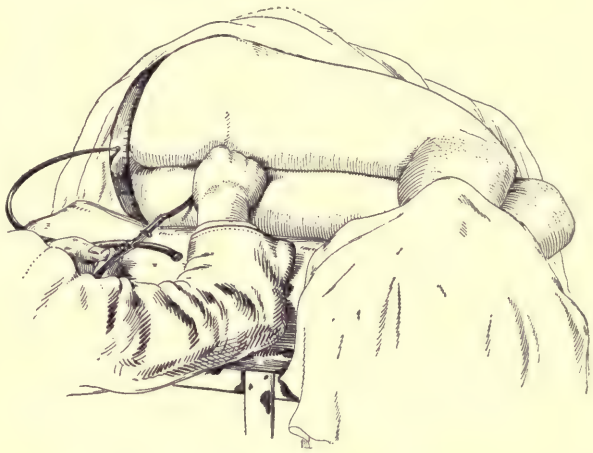


FIG. 2.

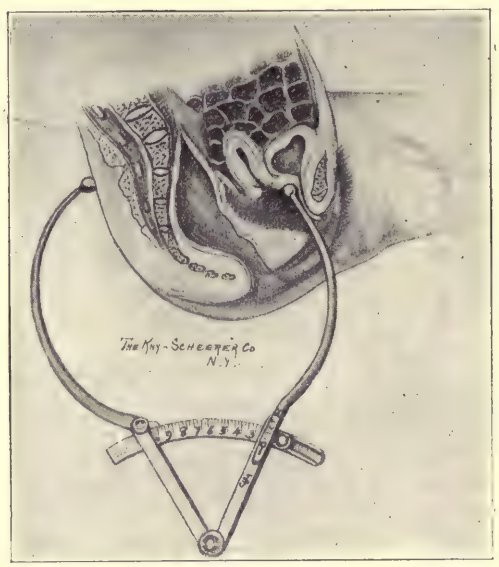


FIG. 3.

drawn fairly tight. The movable or internal branch is then introduced, while the fixed branch is placed posteriorly against the belt. The movable branch is then brought in contact with particular bony points on the internal surface of the pelvis, the distance being recorded on the gauge (Figs. 2 and 3).

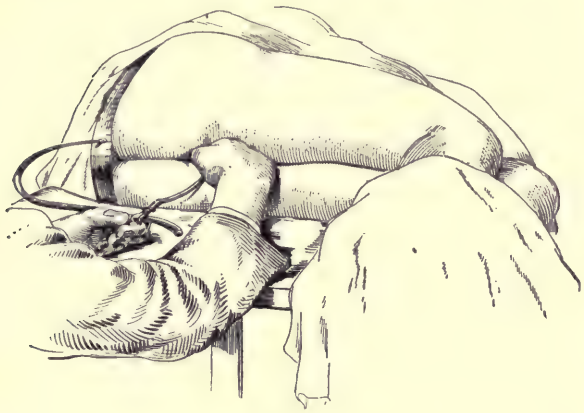


FIG. 4.

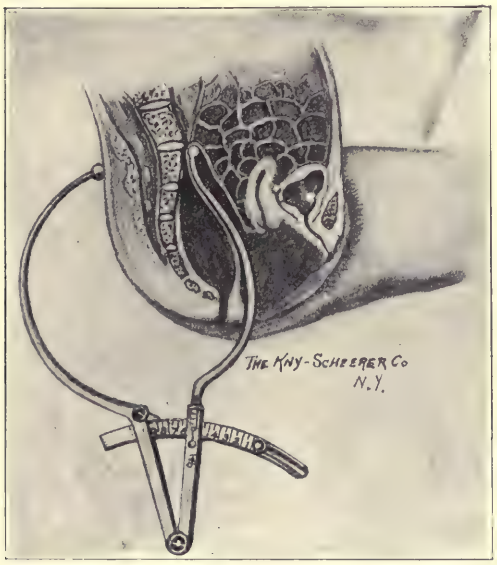


FIG. 5.

To ascertain the true conjugate diameter of the brim place the tip of the fixed branch on the strap over the middle of the sacrum (Figs. 2 and 3). Place the tip of the movable branch in the middle of the posterior or vaginal surface of the symphysis pubis. Move the sliding gauge firmly against the handle of the movable branch and fix it with the set-screw. With the index and the middle fingers of the right hand

FIG. 6.

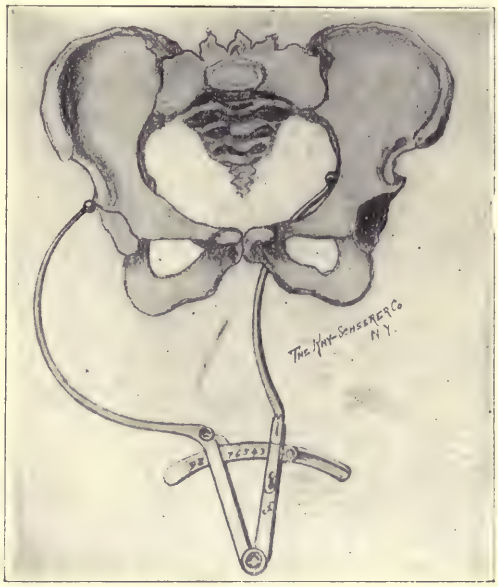


FIG. 7.

guiding the internal branch depress the posterior vaginal wall, and with its tip probe for the sacral promontory (Fig. 5). Holding the in-

strument steadily the number of inches is read off on the gauge.

To find the transverse diameter of the brim, note the number on the graduated belt, which

FIG. 8.

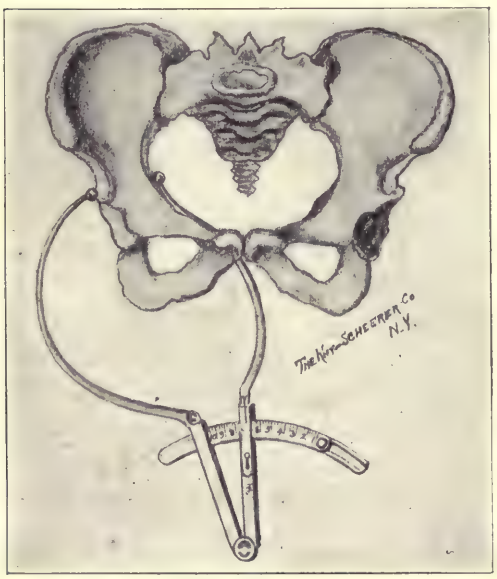


FIG. 9.

is in exactly the median line of the sacrum. Place the tip of the fixed branch on the strap at exactly half that number of inches. This will put it over the center of the pelvis. With the movable branch in the first position go straight across the middle of the pelvis and

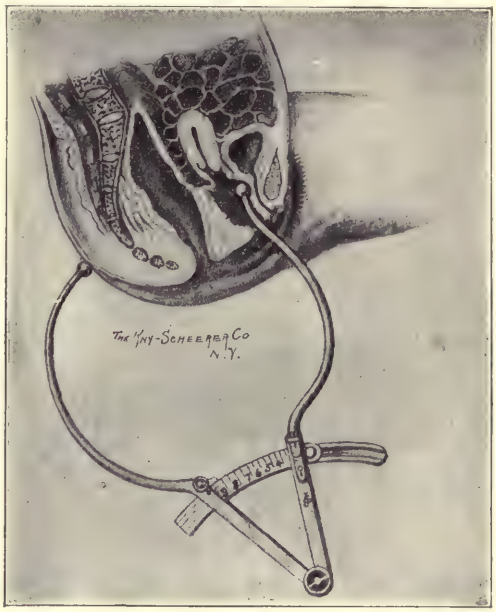


FIG. 10.

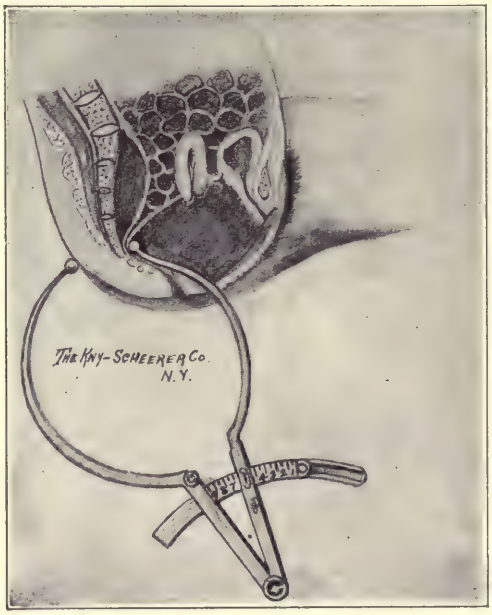


FIG. 11.

high enough to reach the bony ridge, which is the iliopectineal line (Fig. 6). Move the sliding gauge up firmly and set it with the screw.

Withdraw the movable branch, make it assume the second position, and make its point reach up to the iliopectineal line toward you, facing the tip of its fellow on the strap (Fig. 8). Read the number of inches recorded on the gauge.

To measure the oblique diameter of the brim read the number on the belt exactly in the median line over the sacrum, subtract one-fifth of that number, and place the tip of the fixed branch on the strap at that spot. This will be just over the sacroiliac joint. With the movable branch in the first position within the vagina find the left iliopectineal tubercle diagonally across the pelvis. Move up the sliding gauge and set it with the screw. Withdraw the movable branch, make it assume the second position, and with its tip find the right sacroiliac joint so that as the tips of the two branches face each other they include the right posterior pelvic quadrant. Read off the number of inches indicated on the gauge.

FIG. 12.

To find the inferior conjugate place the tip of the fixed branch on the strap as low down as possible on the median line of the sacrum (Fig. 10). The tip of the movable branch in the first position finds the lower edge of the symphysis pubis. The movable branch is withdrawn and its tip in the second position made to touch the sacrococcygeal joint (Fig. 11). Read the number of inches recorded on the gauge.

To find the transverse diameter of the outlet, the patient should be on her back with the knees well drawn up. The skin should be marked over the inner edges of the tuberosities of the ischium. A ready measurement of the transverse diameter of the outlet is found by passing four fingers abreast between the tuberosities of the ischium. If the space is sufficient to admit the four fingers comfortably it may be assumed that no contraction exists (Fig. 12). If the perineum is rigid and the vagina is contracted, the promontory can be reached through the rectum if the latter is inflated. In fleshy patients with a tense abdomen it may be necessary to put the patient in the knee-chest position so as to distend the vagina with air. In this way it is easy to make out the bony landmarks.

Diagnosis and Treatment of Chronic Polyarticular Diseases in Childhood.—

NATHAN, P. W. *Archives of Pediatrics,* 23d year, No. 3, p. 205, March, 1906.

The writer includes under this term polyarticular disease, all joint affections in which there are multiple lesions which show a tendency to permanent joint impairment. They are commonly classed under the head of chronic rheumatism, rheumatoid arthritis, and arthritis deformans, but such a classification is misleading. He gives a history of five cases, the first of which differed markedly from the others. The child was eight years of age, and soon after a recovery from scarlet fever began to complain of pains in the feet. Four months later the child ceased to walk, and complained of pain in the joints of the lower extremity

and in the back. When she came under observation all the joints were swollen, the bone was thickened, and the soft parts had a doughy consistency. The trouble was never inflammatory, but was apparently due to some general metabolic abnormality. It was rather a bone disease than a joint involvement, the deformation of the bones being a cause of the joint disability. The second, third, and fourth cases of the writer's series were all of a distinctly inflammatory type, while the last or fifth case resembled the first in the fact that the disease was primarily in the bone.

The writer divides joint cases into the so-called metabolic cases and those that are inflammatory or infectious. The latter may be divided into osseous forms and synovial forms, such a division being of great value in the treatment of these diseases. Any of the infective microörganisms may cause chronic non-suppurative joint inflammation, and the character of the disease seems to depend more upon the number and virulence of the invading organisms or their location, either in the bone or in the synovia, than upon the variety of the infecting organism. The gonococcus is an exception to this rule, showing a marked tendency to invade the periarticular structures. In the early stages of polyarticular disease it is often impossible to say whether the case is one of periarthritis or osteoarthritis. The treatment in the earlier stages is the same in both forms, and should consist of absolute rest for all involved joints. Complete immobilization is what is meant by rest, and this is best accomplished by a plaster bandage. As a rule fixation immediately relieves the most of the pain. The immobilization should be kept up until the acute constitutional symptoms and active joint inflammation have disappeared. If the immobilization is continued too long there is danger of ankylosis due to bony overgrowth. Gentle passive motion should be inaugurated as soon as the more active symptoms have subsided. In the synovial forms immobilization may be carried out for a longer time.

Hypertrophic Stenosis of the Pylorus.—

ROGERS, J., and HOWLAND, J. *Archives of Pediatrics,* 23d year, vol. xxiii, No. 3, p. 123, March, 1906.

The writers report a successful operation for pyloric stenosis in an infant of three months. This is said to be the third successful operation of the kind in this country. The child began to nurse the day after birth, and continued to do so every two hours. At first there was occasional vomiting, but no initial loss of weight. At the end of the third week the vomiting, which had been slight, became more marked and occurred practically after every feeding. The vomitus was never sour, but contained a considerable amount of mucus. The child was both hungry and thirsty, and water was kept down better than milk. He was seen five weeks after birth. At that time there was constipation, and the weight was 10 pounds 1 ounce. The child was fairly nourished, strong, and cried vigorously. No abdominal tumor could be felt in the region of the pylorus and no peristaltic waves could be seen. A lengthening of the periods of feeding and a lessening of the amount of food, together with the administration of five grains of bicarbonate of sodium before each feeding, improved the vomiting. The improvement was only temporary. From this time on there was a loss of weight averaging about an ounce a day. The administration of one grain of salicylate of sodium partially controlled the vomiting for about a week, when it began again with renewed vigor. When ten weeks old the weight had fallen to 7 pounds 14 ounces, the vomiting persisting and being frequently projectile. Stomach washing was tried, considerable mucus being obtained.

When this was done early in the morning food from the last nursing nine hours before could be obtained. At this time peristaltic waves could be seen and a dilatation of the stomach could be made out.

When the child's weight was found reduced an operation was determined on, after nearly two months of treatment which was futile. Upon opening the abdomen the pylorus was found thickened and felt like cartilage. A posterior gastrojejunostomy was performed. There was a brief rise of temperature following the operation, and there was a cessation of the vomiting for twenty hours, after which there was a return of this symptom for four hours. Two days after the operation improvement began and was very rapid, the child gaining six ounces in the week following the operation, and at the end of three weeks the gain was one pound. When nine months old the weight was 15 pounds 10 ounces. He is now fed at intervals of four hours and takes milk and barley water. The wound is firm.

Intraligamentous Drainage for Non-suppurating Perimetritis.—

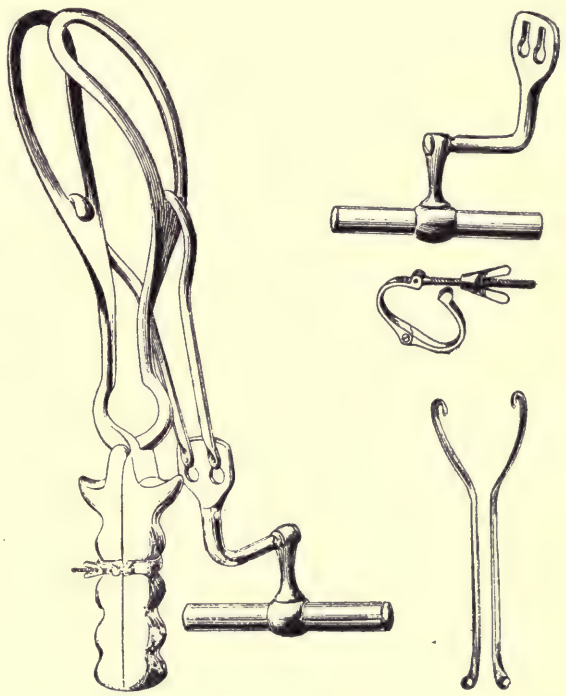
GARRIGUES, L. F. *Medical Record,* vol. lxix, No. 14, p. 545, April 7, 1906.

Perimetritis is defined as a cellulitis between the layers of the broad ligaments, the sacro-uterine ligaments, or rarely between the uterus and bladder. In operating on these cases the writer first curettes the uterus. The cervix is drawn toward the healthy side, and with a forceps the wall of the vagina is caught to one side and slightly posterior to the cervix so as to put the vagina on the stretch. An incision about three-fourths of an inch in length is made through the vaginal wall close to the uterus. Through this incision the forefinger is inserted, keeping close to the uterus, and is pushed well up between the layers of the ligament and then outward into the perimetrium, so as to open up the mass freely for drainage. Should the Fallopian tube be swollen it is opened by means of a blunt forceps guided by the index-finger. A good-sized drainage-tube is introduced either into the perimetrium or into the tube, as the case may be, and the operation is complete. If no pus is present a small quantity of bloody serous fluid escapes. The writer has never used an artery forceps, and has had no deaths following this operation.

An Axis Traction Attachment for Ordinary Obstetric Forceps.—

JAMES, F. W. *Lancet,* vol. clxx, No. 14 of vol. i, p. 978, April 7, 1906.

The advantage of the axis traction forceps has long been recognized, particularly when the head is at the superior strait. The short or straight forceps are useful when there is delay



at the outlet. The expense and trouble of having two sets of forceps is obviated by the device proposed by the writer. An ordinary Barnes-Simpson forceps is fitted with a removable clamp and outside traction rods with han-

dle, the latter having a universal joint. The method of attaching the tractors is simple, and no alteration is required in any standard pattern of forceps. All extra parts are loose, and can be readily cleaned and sterilized. Their total weight is about one and one-fourth pounds.

FORENSIC MEDICINE.

Pritchard the Poisoner.—

British Medical Journal, No. 2363, p. 865, April 14, 1906.

The case of Dr. Pritchard is described in the *British Medical Journal,* the occasion being a review of a volume which forms part of a series dealing with notable Scottish trials. The chief interest centers in the peculiar and reckless manner with which the accused kept poisons in his house and frequently mixed them with food in such a way as, at least on one occasion, to poison himself, and absence of motive. It is to be regretted that more data are not available regarding the mentality of the accused.

Edward William Pritchard, the son of a captain in the Royal Navy, was born at Southsea in 1825. He was apprenticed in 1840 to Messrs. E. J. and C. H. Scott, surgeons at Portsmouth, and afterward studied in London, according to his own account at King's College, but the authorities of that school may be excused for raising a doubt as to the true alma mater of the murderer. He became M.R.C.S. in May, 1846, and the same year was gazetted assistant-surgeon in the Royal Navy, in which service he remained four years. While serving on the home station he met, at the house of Dr. David Cowan, a retired naval surgeon living at Portsmouth, Miss Mary Jane Taylor, whom he married in 1850. In the following year he resigned his commission in the navy and commenced practice in Hunmanby in Yorkshire, but in 1858 he sold his practice in order to give his children the advantage of a town education. He obtained from the University of Erlangen the degree of M.D., conferred *in absentia,* and in 1860 went to live in Glasgow, where he was looked upon coolly by the medical profession, failing to gain admission to the Faculty of Physicians or Surgeons or to any medical society. He made himself known by delivering several popular lectures, which dealt with his own travels and adventures, and with some of his hearers gained a reputation for being fond of pulling the long bow. He also became a diligent Freemason, being admitted to several high degrees in that order; by these means he formed a connection and acquired a fair practice. At that time he is described as being a tallish, well-built man, of rather striking appearance, with pleasant features, light-brown hair, and sandy beard, always neatly dressed, and with manners "characterized by an elaborate, studied politeness, the very perfection of the *suaviter in modo.*" Three years after he settled in Glasgow a maid servant lost her life in a fire which took place at his house, the girl being found dead in her bed without having made any effort to escape. After the fire Pritchard acquired by purchase 131 Sauchiehall Street, the house in which the crimes were committed; he paid £2000 for it, of which £1600 remained on mortgage, the other £400 having been advanced to him by his mother-in-law. The family in Sauchiehall Street consisted of Pritchard and his wife, four children, a cook, and a girl named Mary M'Leod, who acted as nurse and housemaid, and who admitted at the trial that she had become pregnant by the prisoner, and that Mrs. Taylor (the mother-in-law) had seen him kissing her in a bedroom. Two medical students, King and Connell, joined the household in November, 1864. About this time Mrs. Pritchard was taken ill with vomiting, and was for some time confined to bed; but, having par-

tially recovered, she went to stay with her parents in Edinburgh, returning to Glasgow for Christmas. While in Edinburgh the sickness ceased and her health improved, although she remained very weak, but soon after her return home the symptoms reappeared, the vomiting occurring usually after meals; from this time onward she was seldom able to go downstairs to take her meals with the family, and her food was sent up to her room, Pritchard himself often taking it to her. Pritchard is known to have bought large quantities of poisons for which he had no obvious use, as he did not dispense his medicines. Thus from September 19, 1864, to February 16, 1865, he bought 10 grains of strychnine, 4½ ounces tinct. conii, 1½ ounces laudanum, 1 ounce tartar emetic, 3 ounces tinct. aconiti (B. P.), 2 ounces Fleming's tinct. aconiti, 2 ounces tinct. digitalis, 2 ounces solution of morphine, and 8 grains of atropine!

On February 1 Mrs. Pritchard became seriously ill with cramp, accompanied by severe pain, which left her in a very exhausted state. Pritchard wrote to Dr. J. M. Cowan, a retired medical practitioner living in Edinburgh, and a cousin of his wife, asking him to visit her. Dr. Cowan came on February 7, and stayed the night, but did not regard the case as serious; he prescribed a mustard poultice and small quantities of champagne and ice. The night after he left Mrs. Pritchard was again attacked by cramp, and Dr. (now Sir) W. T. Gairdner, professor of medicine in the University of Glasgow, was asked to see her; he was puzzled by the case, thought the patient intoxicated, ordered stimulants to be discontinued, and prescribed simple diet, but no medicine. The next day he called again, and found her better, but was not asked to return, Mrs. Pritchard having objected to him, although her brother, Dr. Michael Taylor of Penrith, an old friend of Professor Gairdner's, urged her to allow him to continue his visits. Professor Gairdner wrote to Dr. Taylor expressing his concern about the case, and strongly recommended that Mrs. Pritchard should be removed to Penrith, a suggestion which was accepted by Pritchard, for such time as she should be in a fit state to travel. On Dr. Cowan's advice Mrs. Taylor went to Glasgow to nurse her daughter, as she had refused to allow a professional nurse to attend her. On February 10 Mrs. Taylor arrived, and two or three days after Mrs. Pritchard had another attack. On February 13, she having expressed a desire to have some tapioca, a packet was fetched from the grocer's, which was left for a short time on the hall table and then taken down to the kitchen, where half a breakfast-cupful was prepared by the cook. It is not certain that Mrs. Pritchard had any of this tapioca, but Mrs. Taylor ate some, and immediately vomited, remarking that she thought she must have "got the same complaint" as her daughter. The tapioca was not used again, and the remains of the packet, when afterward found in a cupboard in the kitchen, proved to be mixed with a considerable proportion of antimony, although the stock from which it had been obtained at the grocer's was free from poison.

Mrs. Taylor was in the habit of taking opium, in the form of Battley's sedative solution, in considerable quantity; it was given in evidence that she had bought 6 ounces between January 18 and February 4, and after going to Glasgow she sent a 5-ounce bottle to be filled. Friday, February 24, was spent by Mrs. Taylor in her daughter's room, and in the evening she had tea with Pritchard and the family in the dining-room, after which she wrote some letters in the consulting-room, and then went upstairs to Mrs. Pritchard's room. A few minutes after the bell rang violently, and the servants on going up found Mrs. Taylor sitting in a chair, very ill and trying to vomit. Pritch-

ard was summoned, and having examined her sent Connell for Dr. Paterson; meeting him in the hall, he said that the old lady "had fallen from her chair in a fit" and had been carried upstairs to her room, adding that she was "in a habit of taking a drop." Dr. Paterson found Mrs. Taylor lying fully dressed upon her daughter's bed, still alive, but according to him she was under the influence of some powerful narcotic; he thought her dying and her state quite hopeless. He said in his evidence that he noticed Mrs. Pritchard, whom he then saw for the first time, and that "he could not banish from his mind the idea, or rather the conviction, that her symptoms betokened that she was under the depressing influence of antimony," but he said nothing about her condition and went home. Later on his bell rang again, and he was asked to return to see Mrs. Taylor, but he excused himself on the ground that he could be of no use. On the following day old Mr. Taylor called upon Dr. Paterson and asked him to give a death certificate, but he refused to do this, and later, when applied to by the registrar, he sent the following letter:

DEAR SIR—I am surprised that I am called on to certify the cause of death in this case. I only saw the person for a few minutes a very short period before her death. She seemed to be under some narcotic, but Dr. Pritchard, who was present from the first moment of the illness until death occurred, and which happened in his own house, may certify the cause. The death was certainly sudden, unexpected, and to me mysterious. —I am, Dear Sir, yours faithfully, James Paterson, M.D.—To Mr. James Struthers, Registrar.

Pritchard gave a certificate of death from apoplexy, and the body was removed to Edinburgh and buried. On March 1 Paterson met Pritchard in the street, and was asked to visit Mrs. Pritchard on the following day; he did so, and found her in bed, very weak and prostrate, complaining of vomiting, pain in the stomach, purging, and constant, urgent thirst; her tongue was foul, her features were sharp, her face flushed, pulse weak, contracted, and rapid; her skin was moist, but cool; her eyes watery, but clear and intelligent. He prescribed small quantities of champagne and brandy with ice, to relieve the thirst and irritability of the stomach. If she tired of these she was to take "granulated citrate of magnesia" and have a mustard plaster applied over the stomach; her diet was to consist of beef tea, jelly, chicken soup, and so on, and he wrote a prescription for some powders containing calomel, gray powder, ipecacuanha, and aromatic powder, of which one powder was to be taken every day. He did not see Mrs. Pritchard again until within four or five hours of her death, when he went at Pritchard's request, and found her propped up in bed, looking wild, her face flushed, tongue foul; she was picking at the bedclothes and wandering in her mind. He thought her state most alarming, and prescribed a draught containing morphine, and it was on this occasion that Pritchard informed him that he kept no medicine in the house, except chloroform and Battley's sedative solution! Dr. Paterson returned home, but about one o'clock the door-bell rang, and he was told Mrs. Pritchard was dying, but before he had had time to dress another messenger came to say she was dead.

Pritchard certified the cause of death as gastric fever, and accompanied the body to Edinburgh with a view to its interment beside that of her mother; it is said that the coffin was opened at his request, and that he kissed his dead victim on the lips. On this same day an anonymous letter was received by the Procurator-Fiscal, which was popularly attributed to Paterson, and of which a facsimile appears in the book; it is evidently written by an educated person who knew the circumstances. A warrant was obtained, Pritchard was arrested on his return from Edinburgh, and his house searched, while a post-mortem examination of

B. J. C. D.

the body of Mrs. Pritchard was ordered to be undertaken by Dr. (afterwards Sir Douglas) Maclagan and Dr. (afterward Sir Henry) Littlejohn. The result showed no obvious cause of death, but the chemical analysis disclosed the unmistakable presence of antimony. A warrant was, in consequence, issued for the exhumation of the body of Mrs. Taylor, with practically the same result. A bottle found in Pritchard's house was identified as the bottle of Battley's sedative solution belonging to Mrs. Taylor, and found in her pocket after her death; it contained a considerable quantity of aconite and antimony in addition to the Battley's solution!

Under these circumstances Pritchard was brought before the magistrates and committed on the charge of murdering his wife and his mother-in-law by the administration of poison. The case was tried in Edinburgh in the early part of July, 1865, when the facts, of which we have given the main outline, were clearly proved, and were not disputed by the defense, which relied on the absence of motive and the unlikelihood of Pritchard being the murderer of two women with whom he lived on most affectionate terms, by whose death he had nothing to gain, while it was suggested that the real culprit was Mary M'Leod, the nurse housemaid, animated by spite and jealousy and the desire to supplant her mistress. This defense was not accepted by either the court or the jury; the Lord Justice-Clerk, who presided, summed up strongly against the prisoner, and the jury unanimously found him guilty upon both counts. He was sentenced to death and taken back to Glasgow; before his death he signed a written confession admitting the sentence pronounced upon him to be just, and his guilt of the death of both women, but he gave no explanation of his conduct beyond attributing it to "a terrible madness" and the "use of ardent spirits;" but there was no evidence that he took spirits, and of the many evil things alleged against him after his downfall intemperance is not one. He was hanged on July 28 and buried in the prison.

Mrs. Taylor probably died from the effects of aconite, introduced by Pritchard into the bottle of Battley's solution, which she was in the habit of taking in large doses, so that she would swallow enough aconite in the mixture to kill her. It was never known by what poison Mrs. Pritchard's death was ultimately caused, but there was no doubt that she was gradually weakened by the persistent administration of antimony continued over many months.

There was no adequate motive for the murders; Pritchard made no pecuniary gain by the death of either victim, while it cannot be seriously contended that he desired to get rid of his wife in order to marry Mary M'Leod, the last thing such a selfish and ambitious man would be likely to do. He probably poisoned the servant who was found dead in bed at the time of the fire, and afterward set fire to the house to hide his crime. He mixed poison indiscriminately with the food in the house, and every one in it ran a considerable risk of taking it; the medical students, the servants, and even Pritchard himself had attacks of vomiting and purging, the result of swallowing food containing antimony. The most reasonable explanation of his action is that he was a homicidal maniac.

The conduct of Dr. Paterson was the subject of strong censure by the Lord Justice-Clerk in his charge to the jury. He said: "Dr. Paterson was under the decided impression when he saw Mrs. Pritchard that some one was practicing upon her with poison, yet had thought it consistent with his professional duty, and, I must add, with his duty as a citizen, to keep that opinion to himself. There is a duty that every right-minded man owes to his neighbor—to

prevent the destruction of human life in this world—and in that duty I cannot but say Dr. Paterson failed." Paterson replied to this in a long letter published in the press, wherein he contended that his refusal to certify to the cause of death of Mrs. Taylor should have been enough to arouse the attention of the authorities, and to have saved Mrs. Pritchard; but the registrar, upon whom Paterson threw the blame, pointed out that if Dr. Paterson wished to have an inquiry made into the cause of death he should not have referred him to another medical man for the certificate, but should simply have declined to certify, and then it would have been the duty of the registrar to report the case to the proper authorities, who would have insisted upon a post-mortem examination. The registrar's letter is not printed in Mr. Roughead's book, but is to be found in the *British Medical Journal* of July 22, 1865, p. 63. Both the *Lancet* and the *British Medical Journal* of that day concurred in condemning Paterson for shielding himself under the rules of medical etiquette, which he said forbade him to return to watch the progress of the case. The view taken in the editorial articles of both papers is that if Paterson really entertained the conviction that Mrs. Pritchard was being poisoned he should have insisted upon a consultation, and have discussed with the consultant what had better be done. It is difficult to believe that Paterson could have been so sure of the nature of the illness as he boasted in the witness-box, and in his letter to the press, where he takes credit to himself for having rightly diagnosed the complaint when Professor Gairdner and Dr. Cowan had been unable to recognize it. He was not without sympathizers in the profession and among the public, for at the end of the year he received a testimonial consisting of a purse containing 200 guineas and a handsome silver salver, bearing a suitable inscription, contributed by a large number of citizens, as a mark of respect and sympathy for him in the difficult position in which he was placed in connection with the case.

What should be the conduct of a medical practitioner placed in the position of Dr. Paterson? In the first place, he may naturally seek to have his opinion confirmed and his judgment supported by a consultation, but this only shifts part of the burden of responsibility on to the shoulders of a colleague, and in itself does nothing to protect the supposed victim. In the recent case of Maud Chapman the judge expressed his surprise that none of the doctors who had seen the murdered girl in the course of her illness had been able to recognize the symptoms as due to chronic poisoning by antimony. One of them, however, was so suspicious that he insisted upon a post-mortem examination, which led to the detection of the crime; yet he was not sufficiently confident to be able to prevent the consummation of the crime. When a medical practitioner is in attendance upon a case where he suspects poisoning he should procure some of the vomited matter, stools, or urine, and have it analyzed; if in this way he is able to get evidence of the presence of poison, he should, in England, inform a justice of the peace, or in Scotland the Procurator-Fiscal.

PUBLIC HEALTH.

Some Influence in Favor of Better Market Milk.— PEARSON, R. A. *Boston Medical and Surgical Journal,* vol. cliv, No. 17, p. 463, April 26, 1906.

The writer, who is professor of the dairy industry in Cornell University, refers to the decided movement in the direction of more sanitary methods of producing and delivering milk. Most States and cities have laws relating to the standardization of milk. Three per cent of fat and twelve per cent of total solids is the

usual required standard. Such standards are easily maintained if they are definite, and a failure to comply with them is easily proved. There are legal regulations relating to sanitary conditions, health of cows, manner of stabling, and character of feed, but it is obviously difficult to state requirements relating to these subjects as exactly as those relating to the composition of milk. Reasonable regulations are generally favored by good dairymen, as it increases the demand for their product. It is manifest that such inspection should be carried out by men who are specially trained for the work and not those who are appointed at the behest of some politician. Regulations should also be enforced that would protect the dairymen by requiring that bottles and other containers should be properly cared for and cleansed before being returned to them. They should also be protected from dishonest competition, such as is likely to come from the claims of a dealer who endeavors to palm off bad for good milk.

A further influence in securing a good supply of pure milk is a demand for it on the part of the public. As a rule the purchaser gives little thought to the purity of milk providing it contains a satisfactory amount of cream and does not sour under twenty-four hours. That the average householder should be negligent in these matters can be readily understood, as he possibly relies on the milk inspection to protect him. The position is very different with large hospitals, where there is ample opportunity for expert examination. The surprising thing is that such institutions contract for their milk with no stipulation whatever as to quality, though it is expected to be up to standard in butter fat and total solids. It is obvious that if public institutions would give more attention to their milk supply it would have an important influence in leading to a general improvement. The chief hindrance to an improved milk supply is the unwillingness of the majority of people to pay even a small advance for improvement in the quality of milk. The production of clean milk adds considerably to its cost, and if the public desires an improvement in the milk supply it must be prepared to pay for the additional outlay as well as for the skill and experience necessary in producing it.

Cancer in the United States.—

McConnell, G. *Journal of the American Medical Association,* vol. xlvi, No. 17, p. 1273, April 28, 1906.

The writer has reviewed the prevalence of cancer in the United States as revealed by the twelfth census. With reference to the vexed question of an increase in the death-rate from malignant disease, this is answered in the affirmative. It amounts to 12.1 deaths in 100,000 of the population. This increase was noticed during the past ten years. Comparing the figures of 1900 with those of 1890, he says that they practically eliminate that source of error which was due to the formerly imperfect methods of diagnosis, and which were applicable to earlier years. A study of the figures shows that the death-rate is higher in the rural districts and small towns than in the cities, and that native whites suffer much less than foreign whites. The death-rate among the foreign whites in the United States is only apparently greater than in their own homes. Cancer is nearly twice as common in women as it is in men, and those employed in hard outdoor work have a higher cancer mortality than the sedentary classes. The areas showing the greatest mortality are mountainous regions that are well watered and timbered. Cancer does not seem to be generally more prevalent along rivers, and a large German population with extensive brewing interests does not seem to favor the production of malignant growths. The average age at death in cancer cases is 58.1 years, and its greatest mortality is found in persons of 65 years and over.

Erythema Scarlatiniforme and Scarlet Fever.—

BEARD, J., and BARLOW, T. W. N. *Lancet*, vol. clxx, No. 13 of vol. i, p. 900, March 31, 1906.

The writers call attention to the greater accuracy in the diagnosis of the acute infectious diseases that has obtained of late years. That there is still further room for improvement is shown by the occasional sending to the infectious disease hospitals of cases of erythema which have been mistaken for scarlet fever. Two cases are reported—one occurring in a boy, and the other in a man who had suffered from his eighth attack. The latter patient did not consult a medical man, as he had become tired of being certified as a scarlet fever case and of being compelled to enter a hospital. In the case of the boy the attack was mild, but in the man there was a smart reaction with some sore throat, headache, and general malaise. This form of erythema has its chief interest because of its liability to be mistaken for scarlet fever; the resemblance is often so close that a capable observer may be unable to give a definite opinion during the first few days. The most striking distinction is the early commencement of desquamation, which in erythema may last for several weeks. It is this early onset of desquamation, often while the disease is still in the florid stage, that distinguishes it from scarlet fever, and the erythematous base observed after desquamation with its peculiar glistening and greasy appearance.

Condition of the Air of the Rapid Transit Subway in New York.—

SOPER, G. A. *Medical Record*, vol. lxix, No. 16, p. 609, April 21, 1906.

The writer gives an exceedingly interesting summary of his studies, which were largely chemical and bacteriological. The investigations covered a period of six months, and show on the whole that the sanitary conditions of the rapid transit subway are in the main satisfactory. The movement of trains was found to be a most important means of ventilation. The amount of carbonic acid in the subway was never very large. The number of bacteria found in the air was always less than the number found in the streets. The number of objectionable bacteria was somewhat greater, and this seems to be incidental to all crowded places. The greatest danger consists in overcrowding. Dangerous bacteria are disseminated by speaking, sneezing, coughing, and spitting. More than 60 per cent of the dust of the subway was found to be iron, the most of which was in the metallic state. Almost the whole of this is obtained from the brakes, and it is estimated that the loss of metallic iron from the brakes amounts to one ton for each mile of the road during each month. Some disagreeable odors were found, but they were not dangerous to health.

Ingestion of Dead Tubercle Bacilli.—

CALMETTE, A., and BRETON, M. *La Presse Médicale*, No. 15, p. 115, Feb. 21, 1906.

The writers in a previous communication showed that rabbits fed on tubercle bacilli of bovine origin soon became tuberculous. The results were quite uniform, the infection generally resulting from three or four feedings, the germs being mixed with carrots or potatoes. Rabbits inoculated with tubercle bacilli if fed on dead bacilli were found to die much more rapidly. Healthy rabbits if given considerable quantities of dead bacilli in their food presented disorders similar to those produced by repeated injections of tuberculin.

These observations show the importance of the toxin in the production of disease. In the case of milk, which is such a good culture medium, it is not sufficient to kill the germs; if they have produced a toxin it will still disorder the health, particularly of children.

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EDITORIAL.

THE TREATMENT OF TUBERCULOSIS IN WORKING PEOPLE IN DISPENSARIES.

Dr. John F. Russell has embodied the results of his splendid work at the Post-Graduate Hospital Dispensary of New York, on the treatment of working people suffering from tuberculosis, in a small volume which summarizes the reports which have appeared in the *Post-Graduate Journal* from August, 1898, down to the first part of the current year. The report includes the detailed history of fifty-five apparent cures for pulmonary tuberculosis in working people who were treated at a dispensary without interruption of their work. The purpose of the publication is to stimulate an interest in the dispensary treatment of working people. Lest surprise may be felt at the small number of cases reported the writer states that at first only those in the incipient stage were accepted, but after 1901 patients in any stage of the disease were received for treatment. It was at first almost impossible to get patients because of the want of reliance on dispensary methods, so that during the first two years only ten were treated, but the number during the last ten years has increased to the full capacity of the rooms, and in the last quarter of 1905 hundreds of applicants were denied treatment because of lack of space. He has found that the limitation of the work to incipient cases is impractical, and that the relief of far-advanced cases is possible, the only necessary condition being that the patient shall be physically able to visit the dispensary twice a day and to obtain suitable food. The most common complications which interfere with treatment are tuberculous laryngitis, old cases of emphysema, and cases with profuse hemorrhage.

Dr. Russell's patients have all been gone over by a committee, lest, as he says, personal enthusiasm should carry him too far in estimating results. The prime object of undertaking the work was to show that dispensary treatment of consumptive working people was possible without interruption to their work; secondly, to convince physicians that pulmonary tuberculosis was curable without climatic or sanatorium treatment; thirdly, to persuade cities to organize dispensaries especially for the treatment of the consumptive poor.

Unquestionably Dr. Russell has made a valuable demonstration of the worth of dispensary treatment when carried out systematically and enthusiastically. There is every reason why his experiments should have succeeded. For years it has been recognized that a considerable percentage of the human race have tuberculosis some time in their lives, the percentage in some series of autopsies reaching as high as 75 or 80. So universal seems to be the presence of some sort of healed tuberculous lesion that some pathologists have gone so far as to state that practically every one is affected with tuberculosis some time during life. Of course all these healed tuberculous lesions mean a case that is cured. There is, therefore, nothing inconsistent in the claim of Dr. Russell that his fifty-five cases have been cured by the assistance given them in the dispensary. When tuberculosis invades the

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

human body, in the majority of cases the host succeeds in overcoming the invasion. The minority succumb. On the one hand we have those with strong powers of resistance, and on the other those whose resistance is weak. Between the two are a large number of cases in which a little additional help will enable them to gain the mastery of the disease. It has been the province of Dr. Russell to show how this additional help can be effectively given in dispensary work. He offers his contribution as some solution of the home treatment of tuberculosis, and one which he hopes will do something to dispel that pessimism too common with the physician. He says: "Manifestly it is impossible for working people to pursue treatment at a dispensary unless the hours of attendance are arranged so as not to conflict with working hours. It has been found of advantage to have patients report twice daily. Treatment lasts months, oftentimes years. The wages of the majority are small. Many are married and have families; others, though unmarried, have some one dependent upon them for support. While it might be possible to pay a physician an occasional small fee, it would be impossible to pay regular fees, however small, covering the entire treatment. They are therefore proper subjects for dispensary care, particularly since their earnings are sufficient to provide food, clothing, and shelter. It would seem the only way in which these people can be reached by systematic treatment."

The plan adopted by Dr. Russell is to have patients attend in the morning, when they come to drink their emulsions and vegetable juice. They also attend in the evening. The evening call is usually longer, and they commonly sit and talk, taking hot drinks and enjoying a sort of social relaxation. The patients are weighed and notes made of their condition every Sunday morning. This constant attention gives an opportunity to teach the patient that there are no specific remedies, and that the hope of cure rests on their faithful carrying out of the rules of correct living. Strict discipline is enforced. The only novelty in the treatment is its application to working people, and the fact that the dispensary must be opened early in the morning and in the evening. The ordinary working hours are from 7 or 8 A.M. to 6 P.M., and attendance on a dispensary is practically impossible for these people unless it is kept open at the hours named.

Dr. Russell has contributed not a little to the modern crusade against tuberculosis in practically showing how the working man may be treated in properly equipped dispensaries.

STATUS LYMPHATICUS WITH DEATH UNDER ETHER IN AN ADULT.

Sudden deaths under anesthesia are beginning to be recognized as due oftentimes to peculiarites on the part of the patient as well as to improper administration or overdosage. Among the most striking conditions which predispose to sudden death is the condition known as status lymphaticus. Recent attention was called to this state by the sudden death of the son of a physician immediately after the administration of a dose of antitoxin. Some capital was made out of this incident by those who opposed the general use of antitoxin at the time when it was first advocated. That death was clearly shown to be due to an enlargement of the thymus, and would probably have occurred following vaccination, a hypodermic injection, or other trivial interference. The condition of status lymphaticus in children predisposes to sudden death from trivial physical causes or emotions such as fright. It is probable that the emotional element and the consequent vascular disturbance is the leading factor. Status lymphaticus is most common in children, but it may occur in adults. It undoubtedly is a cause of sudden death in some cases of surgical interference. Such a case is described by A. F. Furrer in the *Cleveland Medical Journal* for March, 1906. The patient was 28 years of age, and was admitted to the hospital for placenta previa. After packing for the relief of hemorrhage, which resulted in moderate dilatation, ether was administered, the dilatation completed, and podalic version performed in the usual way. Just after turning the child, and before the arms could be freed, respiratory trouble was noticed and the breathing became shallow. The ether was immediately discontinued and artificial respiration started. The child was delivered before respiration ceased, which occured eighteen minutes after the ether was started and about ten minutes before beginning the man-

ual dilatation of the os. At the autopsy no pathological changes were found excepting an enlarged thymus with hyperplasia of the lymphatic glands and the follicles of the spleen, with slight hypertrophy of the thyroid gland.

The number of recorded cases in which status lymphaticus has been found in adults is increasing. Many of the sudden deaths which follow chloroform narcosis are reported from Europe, and are found to be due to this cause. The recognition of status lymphaticus by American surgeons in which ether is more often used than chloroform has shown that death in such cases may follow ether narcosis. It is possible that the anesthetic may have nothing to do with death in these cases.

The recognition of status lymphaticus is very difficult during life. A slight increase of dulness to the left of the sternum or enlarged lymph nodes, together with a pale skin and well developed superficial fat, raises a suspicion of such a state, but these signs can hardly be relied upon to identify the condition.

In discussing the treatment of the condition Furrer says that artificial respiration is of little use, and the heart stops so quickly that drugs have little time to reach the cardiac and respiratory centers even if given hypodermically after the collapse is first noticed. It is possible to anticipate shock by giving digitalis before the operation and morphine hypodermically just before the anesthetic is started. Intravenous injection of adrenalin in normal saline solution 1 in 50,000 has been shown by Crile to stimulate the heart and rapidly increase blood-pressure, and is unquestionably a useful procedure in these cases.

THE DOSE OF DIPHTHERIA ANTITOXIN.

In these pages we have repeatedly discussed the importance of giving diphtheria with a free hand. The results reported by the English pediatricians two years ago showed that a considerable proportion of so-called moribund cases could be saved by the administration of very large doses of antitoxin, often running as high as 60,000 or 80,000 units. That there is still a wide difference of opinion as to the dosage of antitoxin was brought out in the discussion of this subject before the section of pediatrics of the New York Academy of Medicine. W. H. Park discussed the dosage of diphtheria antitoxin from an experimental standpoint. He said it is difficult to estimate the amount of toxin that is present in each case, and that 10,000 units of antitoxin is sufficient to neutralize 5 quarts of the strongest toxic bouillon obtainable. It is evident, therefore, that the method of administration is most important as having a bearing on the directness with which the antitoxin is brought in contact with the toxin. If 10,000 units of antitoxin is injected into the veins of a rabbit weighing 1500 grammes, one hour later each cubic centimeter of the rabbit's blood will contain from 30 to 40 units; on the day following the quantity will have fallen to 10 units per cubic centimeter. If the same amount is given subcutaneously and the blood examined one hour later, instead of 30 or 40 units being found not more than 3 or 4 are obtained. These experiments show that if an immediate effect is wanted in a desperate case the antitoxin should be given intravenously. The experimental data point rather to the efficacy of repeated doses than in giving all the antitoxin in a single dose. The only way to arrive at an exact dosage of antitoxin is to carefully watch cases receiving different doses. He believes that 1000 units is too small, but that 3000 units is nearer the correct amount. When larger doses were employed the differences were not marked—that is, there was no special difference noted between those receiving 6000 and 12,000 units.

C. G. Kerley in discussing the dose of diphtheria antitoxin in private practice urged the use of large doses. Of late he has employed 5000 units as an initial injection. This should be given on the first or second day of the disease, and no difference in the dose should be made because of the age of the child. If such a quantity is given in a majority of the cases no repetition of the quantity will be required when the larynx is not involved. If improvement is not apparent in eight or twelve hours the dose is repeated, thus giving 10,000 units in the first twelve hours. If on the contrary the disease advances in eight or twelve hours following the initial dose of 5000 units, then 10,000 should be administered, making in all 15,000 units.

B. F. Royer said that the amount of pseudomembrane might be taken as a guide. If a single

tonsil is covered the dose should be 2500 units, both tonsils 5000 units, both tonsils and uvula 7500, and when the nares and pharynx are involved from 7500 to 10,000 units. The nasal or nasopharyngeal type is more dangerous than when the exudate is in the throat because of the shorter route to the blood from the lymphatics of these parts.

H. W. Berg expressed the belief that large doses af antitoxin are unnecessary, he rarely exceeding 6000 or 7000 units in severe cases. He uses as a guide the pulse and temperature. If the pulse does not improve in character and diminish after the injection the dose is repeated.

INVISIBLE SCARS.

In the last few years there has been a marked improvement in suturing the skin. The older method of simple division with the interrupted suture frequently left unsightly scars. The subcutaneous suture, while securing a more accurate approximation of the edges of the skin, resulted in far less scarring. In wounds that had been accurately approximated it was often difficult except on close inspection to determine where the skin had been divided. J. L. A. Aymard (*Lancet*, May 12, 1906) describes a further improvement in skin incision by dividing the skin in a slanting direction. He contends that the skin divided at right angles has a tendency to separate under the usual dressings, but a skin that is slantingly divided has a more extensive surface of contact, and the pressure of dressings tends to approximate the divided edges rather than to separate them. This is the first suggestion that the skin incision be made in this way. Accidental wounds are frequently inflicted in which the skin is divided in other than a right angle, and common experience shows that such wounds heal readily and with little or no scarring. In making the slanting incision attention is called to the fact that it requires considerable delicacy of manipulation. In Aymard's opinion too much preparation of the skin is objectionable. Scrubbing the skin with simple soap and water and the application of a dry dressing he considers sufficient. It is better to epilate the hairs along the incision than to shave the part, as in this way the danger of hairs growing into the wound is avoided. The most important instrument is the knife; the ordinary wedge-shaped scalpel is useless for the purpose. Aymard at first used a razor, but later he has had some hollow-ground scalpels prepared which are very sharp, and which make a satisfactory incision. An attempt to divide the skin on the slant with the ordinary scalpel is always certain to result in failure. In making the incision through the skin it should be carefully stretched in all directions by assistants unless it is already stretched by some underlying growth. The knife should be passed in a slanting direction, and it should be sufficiently sharp so that practically no force is needed. The subcutaneous fat should be divided at the same time and in the same manner. There is a tendency in the upper flap to

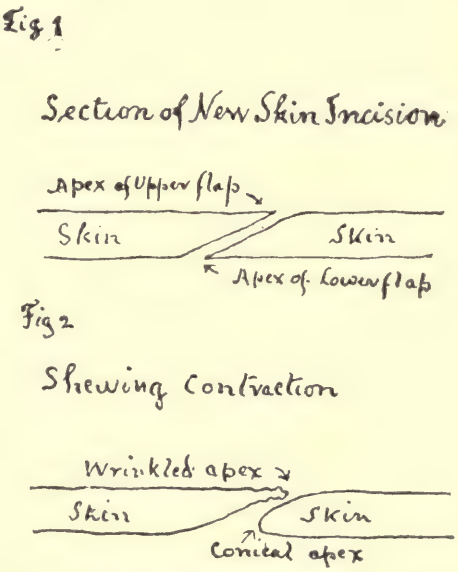

Fig. 1 gives a rough idea of the new incision Fig. 2 gives also a diagrammatic appearance of the condition of the flaps directly after division.

contract and shrivel irregularly. The upper flap after division is enclosed in warm, dry, sterile lint, and is held out of the way with tissue forceps. The lower flap is retracted on the fascia and is treated in a similar manner.

After the operation is completed the wound is closed, and it is usually unnecessary to use sutures. Should they be necessary a single horsehair threaded on a slightly curved needle is passed through the skin at a little distance from one extremity of the wound, and is then passed alter-

nately through the base of the upper and the apex of the lower flap continuously to the other end of the wound. Such a suture is not tied, and it should be removed at the end of forty-eight hours. Previous to inserting the suture the delicate edge of the upper flap must be carefully stretched, using very slight force as it is readily torn. The delicate edge is then carefully spread in its proper position, the accuracy of the adjustment being controlled by observation with a hand lens. The subsequent dressing should keep this edge in accurate apposition, and undue pressure should be avoided. The flaps may be held in position by China silk and collodion. In others collodion may be employed with a curved or flat glass dressing. When glass is employed the exact position of the flap can be seen. Pressure should be light for the first few days. If a rigid dressing is not used the flap may contract, but rather than have the wound heal in a bad position Aymard prefers to break it down and begin over again. Aymard is of the opinion that massage of scars is quite as useful here as it is in the treatment of sprains and adhesions about joints. He says that too frequently the scar of an operation is allowed to take care of itself, and no effort is made to break up adhesions and prevent contractures.

THE TRAGIC SIDE OF CHICAGO'S MUNICIPAL GOVERNMENT.

Chicago may be likened to a municipal Pooh-Bah. Those who recall this delightful character from "The Mikado" will remember that he held a great many offices, and he could frequently be "approached" with a proper fee in one office to influence him in some other capacity. Chicago has the United States government and the State of Illinois both having jurisdiction in matters pertaining to the nation and the State. When we get down to municipal affairs there is a delightful confusion. First there is the county of Cook, that pays the sheriff and the coroner and administers certain public charities, notably the County Hospital, the Poorhouse, and the Hospital for the Insane. Next there is the township organization, which has been in part eliminated in recent years. Then comes the city government proper, which has to do with police, public health, streets, sewers, and similar public utilities. Then another government is spread over the county and some outlying territory known as the Drainage Board, for the purpose of providing an outlet for the sewage so as to keep the lake reasonably clean. Not content with this, it was found necessary to establish another entirely independent system to take care of the parks. It is a somewhat curious arrangement to find that these different governments frequently "owe" each other, and sometimes there are charges that one government treats another "unfairly." Many years ago the square on which the court house and city hall stands belonged to the county, but when the city was organized the county gave it half the block on which to build a city hall. Since then the county has frequently threatened to drive the city off of the land which belongs to it, and recently the decrepit old court house had to be pulled down, which was accomplished in such a way as to nearly wreck the adjoining city hall. When this improvement was undertaken the city obtained from the county a statement that the latter would indemnify the city in case anything happened to the city hall. Recently the city officials were jubilating over the fact that while the city hall was tumbling about their ears the county would ultimately have to pay for it.

Such a system of government would furnish an admirable text for opera bouffe, and one can smile at its absurdities, but at the same time must grieve at a few of its tragedies. One of these is that which relates to the care of persons afflicted with delirium tremens. They are commonly gathered in by the police and are allowed to remain in the station-house, which is under the jurisdiction of the city. The Detention Hospital and the County Hospital, the first for the care of the insane and the latter for sick people, do not receive cases of delirium tremens, and the city having no hospital of its own has no place to send them, consequently they are classed as drunk and disorderly and are sent to the bridewell or city prison, which is under the jurisdiction of the city. Severe cases of delirium tremens are brought in by the police and must lie in an ordinary police-station without medical attendance from twenty-four to forty-eight hours because there is no place to send them, though the illness may be palpable and desperate. A magis-

trate has to first pass upon them, which commonly means a delay of from twenty-four to forty-eight hours before they are sent on their way to the city prison and its hospital. Twenty-four to forty-eight hours elapses, and in some instances they are dying before they reach the hospital. Indeed, the last report of the medical officer shows that two dead men have recently been sent in. One can scarcely conceive of the distress and misery inflicted upon these unfortunates, who while they are to be regarded in a certain sense as self-made wrecks, yet the more modern view regards alcoholism as largely a disease rather than a moral obliquity.

The report of Dr. Sceleth of the House of Correction for 1905 shows that 499 cases of delirium tremens were admitted, and 410 were suffering from alcoholism. Even the police realize the condition of these unfortunates, and are constantly appealing to the hospital at the House of Correction to admit these cases before the magistrate has passed upon them, a thing which the authorities have no legal right to do. Dr. Sceleth calls attention to the need of a city hospital where such cases can be treated, and he refers to the ordinary case of "drunk and disorderly" as a fine example in many instances of the wrong way to do things. Frequently workmen's homes are broken up by the ordinary method of dealing with a man on a "spree." He is arrested, fined, and sent to the House of Correction, being usually given a sentence of 53 or 103 days. While there his family is without support, and when his time expires he commonly finds the family scattered, and this too often leads to his becoming a worthless character or a criminal.

THE MICROCOCCUS NEOFORMANS.

As early as 1886 Doyen reported to the French Academy of Medicine that he had observed in malignant growths certain small opalescent bodies to which he gave the euphonious name micrococcus neoformans. In 1904, in a further communication to the same body, he claimed to have obtained a vaccine and subsequently a serum which would destroy the virulence of malignant growths—in other words, would cure cancer. The careful study that has been made of Doyen's method by Payne and Morgan (*Lancet*, April 7, 1906) would seem to have definitely settled the claims of this alleged cancer cure. The serum was carefully tested in eight cases of cancer, and was found in some cases to be followed by severe pain, and in others by marked constitutional disturbances. In none of the cases treated was there any improvement. In addition to these clinical data the same writers have investigated the presence of the micrococcus neoformans in malignant growths, and have come to the opinion that it is not present in sufficient numbers nor with such reasonable constancy as to be regarded as an etiological factor in the evolution of these growths. The inoculation of animals was followed, not as claimed by Doyen by the formation of neoplasms, but only by an inflammatory reaction.

Jacobs and Geets (*Lancet*, April 7, 1906) come to quite a different conclusion as to the specificity of Doyen's micrococcus. They claim that it is the cause of cancerous cachexia, but that the anticancerous serum of Doyen is useless, though it is practicable to immunize the organism by means of a series of inoculations of the micrococcus neoformans vaccine, providing that these are properly controlled by examinations of the opsonic power of the blood.

THE OWNERSHIP OF PAPERS READ BEFORE SCIENTIFIC SOCIETIES.

The most serious inroads that official organs are making into the domain of the independent medical press has been the restriction of publication of papers read before scientific societies to the official organ. A few years ago there were no medical journals that were owned by medical societies. The American Medical Association published its papers in the form of transactions which were issued as annual volumes, and it did not preclude the members from publishing their papers in medical journals. With the establishment of the *Journal of the American Medical Association* it was required that those who read papers before the various sections should submit a full abstract or the original paper for publication in the journal of the association. So far as we are aware the *Journal of the American Medical Association* has never assumed that the title of the paper resided wholly in the *Journal*, but it has refused to publish papers

which were printed elsewhere prior to the time that they could appear in the *Journal*. The tendency of the State journals is to establish a far more rigid rule, and to assume that ownership of the paper passes to the State society organ when it is read at one of the meetings.

This same question has been raised regarding the Toronto meeting of the *British Medical Association*. According to the rules adopted "all papers read are the property of the British Medical Association, and may not be published elsewhere than in the *British Medical Journal* without special permission." The *Montreal Medical Journal* in commenting upon this says there is no statement as to who is authorized to give the permission, but that it proposed to be guided by the authority of the reader. It further states that it is excellent journalism to endeavor to secure so large a body of material for exclusive publication at No. 2 Agar Street, and if that is the intention it is the opinion of the *Montreal Medical Journal* that it should have been specifically stated, and that it should be the right of the reader of the paper to choose the medium through which he will seek publication. It believes that the prestige of the *British Medical Journal* is so immense that it can well afford to adopt this sound principle of freedom, allowing to each reader and each journal entire liberty of action. That this is sound doctrine no one will question, and is quite as applicable to the various State society organs as it is to national publications both in this country and in England. If the other rule is adopted and strictly adhered to, that all papers read before medical societies must appear solely in the official organs, it will do much to eliminate independent medical journalism.

"THE UNITED STATES DELEGATE SPOKE AMERICAN AND WAS MERCIFULLY BRIEF."

The above quotation is the succinct account of the manner in which the United States appeared at the International Medical Congress at Lisbon, as reported by the correspondent of the *British Medical Journal*. When an international medical congress assembles it is common for them to be opened by some person of exalted rank. At Moscow one of the grand dukes officiated, and at the Lisbon Congress the King and Queen of Portugal were present, and the King opened the Congress by a speech in French, which the correspondent said he used with a vivacity and smoothness which lent a special charm. Following the customs of former congresses various countries were heard from. Waldeyer spoke in German, though the last sentences of his speech were delivered in French, and following him Obersteiner spoke for Austria, Coni for Argentina, Dejace for Belgium, and Cortezo spoke for Spain. Bulgaria, Chili, and Cuba were heard from, though in just what languages the correspondent fails to inform us. Then "the United States delegate spoke American and was mercifully brief." It is to be hoped that he used his mother tongue with fluency, but it is not certain that the correspondent of the *British Medical Journal* was able to understand him. This pitiful little incident is most discouraging, and is calculated to stamp us as provincial beyond the hope of resurrection. To have any standing on the other side of the water we should at least have a man who could speak English so that he may be understood by those who study that tongue. By addressing the Congress in "American" he was evidently taken out of the list of the learned. We cannot help but contrast the appearance which America made as compared with that of England, for we are told that "Sir Dyce Duckworth made an excellent speech in the name of the British government. Touching with diplomacy on the international relationship of the two countries he captivated his audience and gained bounteous applause by concluding with '*Viva el Rei!*' '*Viva a Reinha!*'" The delegate for Italy is said to have made a fine speech in Italian, and Oishi spoke for Japan, though in what tongue is not stated. After Posner, who represented the International Associated Press, had spoken the meeting adjourned. As a further triumph of England the correspondent says: "It was interesting to note how much the English university gowns attracted the attention of the Portuguese crowds outside the hall."

Poor little America! Represented by a man who spoke "American" and who evidently had no gown to attract attention. The only thing that was commendatory in his performance—even his name seems to have been unknown to the correspondent—was that he was "mercifully brief."

DISCOVERY OF PARASITES IN BLOOD PREPARATIONS OF YELLOW FEVER.

During the past quarter of a century many observations such as those which form the basis of a recent paper by Max Schueller have appeared in print before a sufficient number of repetitions and confirmations have given them scientific value. Schueller is known in the literature through contributions to the etiology of rheumatism, of tumors, of syphilis, and of sarcoma. As a general parasitologist we are less well acquainted with him than as a specialist in the etiology of obscure diseases, in which he seems to find it convenient and comparatively easy to discover and present the life history of protozoan parasites to his own complete satisfaction. This most recent contribution appears in the *Berliner klinische Wochenschrift*, vol. xxxiv, No. 7, Feb. 12, 1906, p. 198. He says that through the kindness of Surgeon-General Wyman and Dr. Goldberger of the United States Public Health and Marine Hospital Service, stationed at New Orleans, La., there were sent to him in November, 1905, two slides containing spread blood (unstained) of a case of yellow fever thirty-nine and one-half hours old. These blood smears he stained, one by the methylene-blue method of J. H. Wright, the other with thionin, and then examined under a magnification of one thousand diameters, the system of lenses used being the Zeiss apochromatic with compensating oculars. He, of course, regrets the paucity of material with which to work, and yet so confident is he of what he sees that he virtually acquaints us with the entire human developmental cycle of what he believes to be the parasite of yellow fever. The organisms, moreover, are of such characteristic form, absorb the stain with such avidity, occur in such considerable numbers, and bear such a close resemblance to other well-known parasites, that it seems extraordinary that they should have escaped the careful investigations of Carlos Finlay, John Guiteras, Walter Reed, James Carroll, Aristides Agramonte, M. J. Rosenau, and the host of other competent investigators with time, material, and apparatus at their disposal, and whose researches of many months have ended fruitlessly—this is even more extraordinary than that a man who has already discovered the etiological agents of rheumatism, syphilis, carcinoma, sarcoma, and other obscure diseases should find this parasite. Those who think the amount of work done, the material with which it was done, and the remoteness of the time and place from that at which the blood was taken, justify the description of a parasite such as we have mentioned will do well to refer to the original paper. Our own feeling prompts us to consign these observations to that same oblivion into which the cryptococcus xanthogenicus of Freire, the bacilli of Gibier, Sanarelli, Sternberg, and others, and the mixococcidium stegomyiæ, have fallen.

SUGGESTIONS FOR THE TREATMENT OF MALIGNANT DISEASE.

Those who have read the contributions made by the cancer research commission in England have doubtless been impressed by the fact that comparatively little has been evolved that seems to have a practical bearing on the management of cancer. The thoroughness with which these investigations have been made and the material accumulated will undoubtedly prove of great value in the near future. Perhaps the most important observation is the demonstration that malignant disease in the lower animals is capable of transmission from one animal to another, and this admits of its experimental study. Already two suggestions have been made which at first seemed to give some promise in the treatment of malignant growths. One was the injection of trypsin, which was found to prevent the spread and cure that form of cancer known as Jensen tumor which occurs in mice. The theory upon which this treatment was based was that the trypsin caused a digestion of the tumor. W. A. Pusey, in the *Journal of the American Medical Association* of June 9, 1906, reports on the treatment of seven cases by this method, and comes to the conclusion that it is practically valueless. In only one of his cases in which there was a circumscribed tumor mass did the trypsin seem to be of benefit.

Another suggestion along the same lines is that of Odier, of Geneva, who claims that new growths are malignant in direct proportion to the amount of glycogen they contain, and it is this substance which determines their cellular activity. He contends that both in the cancer and its cachexia there

is an increased activity of the lipase ferment and a diminution in the glycolytic ferment of the blood. He claims that it is possible to bring about a disappearance of glycogen from healthy tissues, and also from tumors, by the injection of a mixture of extracts from the pancreas, liver, and muscle. Such an extract attacks the glycogen of tumors, arrests their cellular multiplication, and reduces them to an inactive foreign body—at least this has been the result achieved in the inoculated cancer of mice. He believes that the observation is applicable to the human being. A further deduction is that the examination of the glycolytic power of the blood is important from a clinical standpoint, as when it is lowered or absent it is an indication that the organism has become a suitable soil for the development of a neoplasm.

A NATIONAL FRATERNAL SANATORIUM FOR TUBERCULOSIS.

Those who have not observed the progress of fraternal insurance in the United States scarcely realize its extent and the benefits that have been conferred upon the members of these fraternal orders. In many instances they have not been wisely managed; the rates have been made too low, necessitating an increase in assessments. Not a little cheap wit has been indulged in at the expense of fraternal insurance and in favor of the solid old-line companies, but time tries all things. It has demonstrated that some fraternal insurance was not based on sound principles, and what has recently been shown up in reference to the old-line companies requires no recital, as it is still remarkably fresh in the public mind. Fraternal insurance has met the wants of many, particularly those who could not afford the ornamental features of the higher-priced sort. Dr. A. L. Craig, chief medical examiner of the Fraternal Tribunes, has been urging a movement for the establishment of a national sanatorium for the treatment of tuberculosis available for members of different fraternal organizations. This coöperative sanatorium association is trying to raise the necessary funds to convert the Montezuma Hotel property at Las Vegas, New Mexico, into a sanatorium. It is hoped that the unusually favorable climate of that region, supplemented by thorough medical supervision of the patients, a varied and abundant diet, rest, and life in the open, will give an unusually high recovery rate. It is obvious that a movement among the fraternal insurance organizations is calculated to do an immense amount of good. This movement, if earnestly supported by the fraternal organizations, should be one of the most important and far-reaching of the recent efforts to help the tuberculous.

THE SANATORIUM CARE OF TUBERCULOSIS.

At present the profession is much alive to the value of open-air treatment for tuberculosis, and is pretty generally convinced that the best place for carrying it out is in a sanatorium. There is some danger that the sanatorium treatment will be handicapped by some of the same conditions that have led to the abandonment of the climatic treatment. The fallacies in the climatic treatment were numerous. The mere hope that climate alone would benefit tuberculosis could have had no basis except when instituted in the very earliest stages of the disease. Even then its palpable disadvantages, such as homesickness, overexertion, and improper dietary in the case of those whose means were restricted, would overcome any possible benefit of a change in environment. Patients who were suspected to have tuberculosis were kept at home, given cod-liver oil and cough mixtures in the hope that they might be benefited, but the disease advancing, finally as a last resort they were sent to some of the numerous places which were believed to afford relief to the tuberculous.

The present sanatorium care is in danger of meeting with these same troubles. Patients are likely to be treated at home until the golden opportunity for recovery is past, when it is evident that the invasion of the lungs is progressing, and then they will be sent to a sanatorium. For this treatment to have a fair chance it must receive patients in the earliest stages. The diagnosis must be made on suspicion. It is far better that a few patients should be sent to a sanatorium for tuberculosis who haven't the disease than that the golden opportunity of treating it in its very earliest stages should be lost. In the warfare on tubercu-

losis everything depends upon the physician and the early recognition of the disease. This alone will give the modern sanatorium treatment a fair chance. In selecting patients for admission to sanatoria the greatest good to the greatest number should be carefully considered. This means that advanced cases should not be associated with those in the incipient stages. It may be necessary to provide hospitals for those who are advanced in the disease, but they should be rigidly excluded from institutions which are devoted to the care of incipient cases.

DESICCATED BUTTERMILK.

Those who are familiar with the Abstract department of this journal will recollect the numerous and favorable references to the use of buttermilk in the intestinal disorders of children. For more than a century it has been extensively used in rearing children in Holland, but it is only within the last three or four years that it has attracted the attention of pediatricians. Wherever it has been tried—and it has now been used by some of the best observers in Germany, France, England, and the United States—all have united in praising it as a food especially useful in the treatment of fermentative conditions of the intestinal tract. Baginsky was one of the earliest observers to recommend fresh buttermilk, and he has now devised a desiccated buttermilk which he claims is useful in the feeding of children affected with intestinal disorders. The buttermilk is prepared in the usual way, and is then evaporated, the resulting mass being reduced to a fine powder. This is mixed with 200 parts of water, and is used the same as fresh buttermilk, given frequently and in small portions.

THE BOSTON MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

The last meeting of the American Medical Association was the most successful in its history. Not only was the registration the largest, almost 5000, but the meeting both from a scientific and social standpoint was superior to any that the association has held. In large measure this was due to the thorough preparation of the Boston profession. Everything had been provided for in advance. The entertainments were brilliant and were so arranged as not to interfere with the scientific work. It can safely be said that at no time in its history has the section work been so uniformly good, and associated with it were a large number of practical demonstrations in the various fields of clinical medicine. Perhaps the only feeling of regret with those who have attended the Boston meeting is that the time afforded did not permit them to see half what they would like to have seen.

ORIGINAL ARTICLES.

VISUAL HALLUCINATIONS ON THE BLIND SIDE IN HEMIANOPSIA.

BY CHARLES W. BURR, M.D
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Hallucinations confined to one lateral half of the visual field are much rarer than those appearing throughout the whole field. They occur both in so-called functional disease (*e.g.*, epilepsy and migraine) and in organic affections of the brain. They occur with or without hemianopsia and hemiplegia, or they may immediately precede the onset of either, and cease when the palsy or blindness is established, or persist. They may be transitory or last many months. Sometimes they appear only in the dark, sometimes disappear on closing the eyes. The sane and the insane are alike subject to them. They occasionally occur in organic insanity, and Frederick Peterson (*New York Medical Journal*, Aug. 30, 1890) has reported one case in a paranoiac. The patient, a man 20 years old, saw various people and skeletons always on the right side. The report gives no reason to suppose that any gross organic brain lesion existed.

Years before Peterson's paper Calmeil (De Boismont: On Hallucinations, English translation, 1860) reported the case of a lunatic who was in the habit of seeing, to the right of him, a number of beautiful women, whom he would sometimes address with insults, sometimes with compliments. He was blind, and after death both optic nerves were found to be atrophied.

Peterson (*New York Medical Journal*, Jan. 31, 1891) also reports a case in a sane woman 45 years old associated with hemianopsia without hemiplegia. A week after childbirth the patient was seized with pain in the right temple lasting for two weeks, when vision became indistinct, to be soon followed by right homonymous hemianopsia. A few days later she began to see cats, dogs, and children in the blind field. The hallucinations were constantly present for four weeks, when they suddenly disappeared, the hemianopsia continuing.

Henschen (Klinische und anatomische Beiträge zur Pathologie des Gehirns, Upsala, 1890) reports four cases. One patient after an apoplectic attack causing right hemiplegia and aphasia, had a second which added hemianopsia, and finally a third, after which he saw for several days a boy near his bed. At autopsy there were found softened areas in the occipital lobe, internal capsule, and frontal radiation. His second case, a man 60 years old, had left hemianopsia without hemiplegia. There was some word- and mind-blindness, and he saw persons and faces in the blind field. The right cuneus, lingual lobe, and thalamus were softened. The third case was one of left hemiplegia and hemianopsia. The patient saw water, fire, smoke, and soldiers in the blind field. He also had auditory hallucinations referred to the left ear. The fourth case was a woman, 76 years old, who, suffering from right hemiplegia, aphasia, hemianopsia, and some mind-blindness, saw cats in the blind field. She improved.

De Schweinitz reported (*Journal of Nervous and Mental Diseases*, May 2, 1891) a patient who before the onset of a left lateral hemianopsia saw chairs, tables, etc., in the fields afterward obliterated. The patient later died in an asylum, and Dercum found gummatous infiltration at the base of the brain pressing upon the right optic tract, with more or less edema of the pia mater, and meningitis. Whether the occipital lobe was diseased in any way de Schweinitz did not know.

Willbrand (Die hemianopischer Gesichtfeld Formen und das Optische Wahrnehmungs Centrum, Wiesbaden, 1890) refers to a diabetic with hemianopsia, who when in a dark room saw cats, heads, etc., in the blind half field. The hallucinations disappeared in a few days. Three weeks later the patient died after an apoplexy with right-sided hemiplegia. The brain showed general atheroma. The optic tracts and chiasm were normal, but there was some softening of the occipital lobe. Several other authors (Nettleship,

Putzell, Lancy) have reported other cases, but they throw no further light on the condition.

The history of my case is as follows: B. D., a white man, 20 years old, was admitted to my wards at the Philadelphia Hospital in March, 1906, complaining of blindness on the right side and of seeing devils, angels, and bright lights in the blind field. He knew that the objects seen were unreal. They were not persistent, but came and went. Sometimes they appeared for only a minute or two, sometimes remained for hours. They were never visible on the left side. They were small, sometimes movable, sometimes stationary. They last appeared a couple of weeks after his admission to the hospital. He stated that they appeared first some time previous to his admission and several months after an attack of unconsciousness. He also complained of severe headache. He was taken soon after the attack to the Episcopal Hospital, where he was under the care of Dr. Edsall, who has kindly given me the following history:

"On the 27th of July, 1905, he became suddenly ill, vomited, and became unconscious. The unconsciousness lasted a short time, and he then became delirious. On the following day he was brought to the Episcopal Hospital in a state of stupor. He could be roused, and when roused was confused. Light disturbed him, and he put his hands to his head as if in pain. There was no paralysis of the arms, legs, face, or ocular muscles. The pupils were unequal, at times the right being the larger. Both reacted to light. The knee-jerks were present and equal. Kernig's sign was absent on admission, but was present for a short time about a week later. The Achilles and plantar jerks were present. He had full control of the sphincters. The urine was normal.

"On the 30th of July Dr. Van Pelt found hyperemia of the retina, more marked in the left eye. No hemorrhages were present. Reëxamination of the eyes on the 4th of August showed neuroretinitis, the edge of the optic nerve being indistinct and the swelling one diopter over normal. There was general hyperemia around the disk. The left eye was in the same condition as the right, except that there was a retinal hemorrhage in the periphery in the lower temporal region. By the 10th of August the mind was clear and he talked better. On the 22d of November another examination of the eyes showed the typical appearance following a marked neuroretinitis. The edge of the disk could be outlined, but was still hazy. It was infiltrated and presented the appearance of the postneuritic state. The swelling of the disk had gone, and there were still a few hemorrhagic clots undergoing absorption. He had a right homonymous hemianopsia. (The notes do not state the date on which hemianopsia was discovered.) His station and gait were normal. There was no paralysis in either arm. The knee-jerks were exaggerated, but equal on the two sides. He had a little hesitation in speaking. He read well. He complained some of headache. He was discharged on the 25th of November much improved."

My own examination revealed the following: The one prominent symptom was right homonymous hemianopsia. There was no palsy of any cranial nerve. The arms and legs were not paralyzed. Tremor of the hands, lips, or tongue was not present. Gait and station were good. The right knee-jerk was normal, the left distinctly increased. The biceps-jerk was the same on both sides. There was no anesthesia in either hand, and he recognized and named objects by touch well. In speaking he occasionally had to stop and think before he could recall the word he wished to use. He recognized his difficulty in speech. There was no disturbance of articulation, but slight difficulty in remembering words. He understood perfectly all that was said to him. He could write either spontaneously or from dictation, but made some mistakes in spelling, dropping out letters or adding syllables, which apparently was not due to not having been taught how to spell, but to a slight degree of sensory agraphia. He could not write a very long sentence at dictation because he would forget the latter part of it. The handwriting itself was good. He could read aloud without difficulty and understood what he read. While under my care the patient presented no mental symptoms except slight slowness of thought. He realized perfectly the unreality of the hallucination.

Dr. Oliver found the following condition on examining the eyes: Vision in the right eye 5–15, in the left eye 5–10. The pupils were equal and 3 5-10 mm. in diameter. They responded to light and convergence well. There was complete right-sided homonymous hemianopsia, with slight con-

traction of the field of vision on the left side. The extra-ocular muscles were normal. There was slight atrophy of the right nerve, but the left was normal.

We cannot go further in localizing the disease in this case than to say there was probably a gumma or specific arteritis (he had a clear history of infection and bore treatment well) somewhere in the occipital lobe. The presence of optic neuritis points rather to a massive gumma than to specific arteritis. Whether the cortex of the cuneus was actually and entirely destroyed, or whether the white matter under it was affected without cortical involvement, cannot be determined. That the cuneus may be destroyed without causing hallucinations has been proven by many cases. On account of the visual agraphia (at least this is the most probable explanation of his difficulty in writing and speaking) I believe the higher visual center, on the convex surface of the occipital lobe, was either itself or the white matter underlying it slightly diseased. It may have been merely pressed upon. In any event there could not have been complete destruction of the higher visual center, nor of the fibers coming from it.

As to the value of hemianoptic hallucinations as a localizing symptom the opinion of Schmidt Rimpler (Die Erkrankungen des Auges in Zusammenhang mit andern Krankheiten, 1898) is that "they do not necessarily indicate that the visual center itself is involved in disease, but that more extensive zones in relation with optic memory and optic perception may be effected." There must be stimulation of the higher visual center to cause a hallucination, but disease at some distance might well be competent to act as an excitant. In the insane it is very probable that disease of the optic nerves or chiasm may produce sensations, which being falsely interpreted lead to visual hallucinations of definite and distinct character, not mere flashes of light, but people and things; but it is doubtful if such hallucinations occur in the sane without either organic or nutritional disease of the occipital lobe. A distant massive tumor might indirectly by pressure irritate the higher visual center.

ON ORNITHODOROS MOUBATA, MURRAY: A DISEASE-BEARING AFRICAN TICK.

BY F C. WELLMAN, M.D.

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INTRODUCTION.

It was on the occasion of my first visit to Angola several years ago that I made the acquaintance of the tick mentioned in the title to this paper, but I only began to study it specially during the course of some researches concerning human spirillosis undertaken in 1904. While investigating this disease I naturally sought information regarding the tick which undoubtedly transmits it in this region, and stray notes on the history, metamorphosis, habits, and morphology of the animal (part of which has appeared from time to time in different journals) have collected until it has seemed that they may be of sufficient interest to publish as a whole.

NAME.

The native name for the tick in Angola is "Ochihopio," and probably has reference to the burning sensation following on its bite, or possibly to the fever which is caused by it. The scientific name, which, for reasons given later (*vide infra* "Historical Note"), should be adopted, is *Ornithodoros moubata* Murray (1877).

SYNONYMS.

Argas moubata Murr., 1877 (Journal of Travel); *Ornithodoros savignyi* var. *Cæcus* Neum., 1901 (Mém. Soc. Zoöl. France, xiv, 1901); *Acarus moubata*, Kufu, Mbu (Tete); Tampao, Garrapato (Portuguese); Karapatti; Lirvuns (Bantu).

HISTORICAL NOTE.

The first mention of *O. moubata* in scientific literature was the description of some specimens collected in the colony where this is written (Angola) by Dr. Friedrich Welwitsch, whose admirable collections of the plants of Lower Guinea have made his name well known to all

botanists. Neumann described in 1901 a tick which he admits to be synonymous with this species under the name *O. savignyi* var. *Cæcus*, but I prefer to retain the name *O. moubata* Murr., as the tick under discussion seems to be clearly different from the original *O. savignyi* Aud., of Egypt, Somaliland, and British East Africa, first described from Egypt in 1826 (although sometimes known as *O. morbillosis* Gerst., 1873), and was, as has been shown, discovered by Dr. Wilwitsch and described by Andrew Murray in his Journal of Travel nearly a quarter of a century before Neumann's description was published. Dr. Livingstone was the first to describe the disease to which the tick gives rise. He met the condition in Portuguese Southeast Africa. Later Sir John Kirk and Drs. Dowson, Daniels, etc., verified Livingstone's observation. The writer has recently described the disease from Angola, where the tick was first found. Ross and Milne in Uganda were the first to definitely establish the connection between tick fever and spirillosis, and their announcement has been confirmed by Dutton and Todd on the Congo.

BIONOMICS.

Habits. The Ochihopio tick is a veritable pest throughout the whole of Angola. They infest the huts and camps of the natives in great numbers. I have found as many as a hundred in an hour in an old native hut. In some places they become an intolerable plague, and the blacks are not seldom compelled to burn their old kraals and build new ones in order to escape them. They hide (like the bedbug, *Acanthia lectularia* L.) in the thatch and cracks of shelters and houses and come out at night to bite. They bite both man and all domestic animals. I have found as many in pigsties as in any other one situation. When ready to bite, the animal fastens itself to the skin of its host by means of the double hooks on its legs and inserts first its mandibles, followed by the hypostoma, until the rostrum rests against the surface of the victim's skin. When satisfied, by which time it has increased to ten times its original weight, the tick drops off, and, if a female, seeks a place to lay her eggs. The feces voided after feeding are white. Unlike some ticks, *O. moubata* lives for years and preys on an indefinite number of hosts. It is tough and somewhat difficult to kill. When placed on its back on a smooth surface which affords no hold for its legs, such as a piece of glass, it has a curious fashion of contorting its body to enable it to roll over. When touched or otherwise disturbed while moving about it folds up its legs and remains motionless for a short time. Compared with other acari the Ochihopio is fairly active in its movements. If placed, however, in a covered dish the ticks will, after an initial attempt to get free, remain quiet for days at a time, only moving if the dish, or table on which it rests, is struck.

Life history. The following is a sketch of the life history of *O. moubata* as observed by the writer in Angola: The ticks were fed on the blood of a young pig. Copulation was seen in two instances, the ticks grasping each other with their legs and approximating the dorsal surfaces of their bodies. Two large impregnated females were placed in a covered glass dish in which was a handful of dust from the floor,[1] into which the ticks immediately burrowed. They were given no food and examined frequently. It was nearly two months (57 days) before any eggs were laid. The first batch of eggs laid by tick No. 1 numbered 49, the parent "setting" on them for two days (until I turned her over to examine the eggs) as if to incubate or protect them. The second batch, laid by the same tick the day after I removed her from the lot of 49 eggs just mentioned, numbered 29. She also "set" on these for four days. Although unmolested she had abandoned them on the morning of the fifth day. Tick No. 2 behaved similarly, except that she did not begin to lay for a week after her companion had finished, and that she laid three batches of eggs, which numbered 28, 41, and 19 respectively, or in all 88. The eggs are black, round, measure 800 to 900 microns in diameter, and adhere together, looking not unlike a tiny bunch of grapes. The history of the eggs was as follows: At the end of one week differentiation of the egg contents could be made out, and the larvæ could be definitely seen a few days later. No

[1] Dust or sand used for such experiments should be first sterilized by heat. In the observation I am detailing eggs of another species of tick (which has been forwarded to the British Museum for determination) were overlooked, and its free hexapod larvæ were at first taken for those of *O. moubata*, and caused great confusion and fallacy until I finally separated the nymphs.

movement was observed. On the fifteenth day there emerged from the shell, not larvæ but octopod nymphs. The exuviæ of the larvæ are probably left by the nymphs in the shell of the egg. As the nymph grows it gradually becomes of a yellower tinge, until the time of its next moulting, but when it exuviates the new shell appears to be more of a greenish hue. In moulting the skin first splits around the edge of the body and the tick crawls out. After this ecdysis is complete the exuviæ may be seen lying about. They are of a pale-yellow color and perfect casts of the acarus. The adults vary greatly in size. They seem to attain greater dimensions in some localities than in others. The largest individual I have measured was about 11 millimeters in length after having gorged itself with blood. It has been stated that the female lays her eggs shortly after feeding and then dies. As I have mentioned above, nearly two months elapsed between the feeding of the ticks used in

FIG. 1.—*Ornithodoros moubata* Murray. Female, dorsal surface. Large adult. Natural size.

my observations and their ovipositing, and both females have been kept to date without food (eleven weeks since laying their eggs) and are still alive and active.

Enemies. An interesting question is that of the parasites and other enemies of the tick I have studied. In one locality in Bihé district I observed a fungus which sometimes attacks and destroys them. The disease generally begins at one edge of the tick and appears in the form of a light, almost white spot which spreads. The infected ticks are more sluggish than healthy ones. Later, bearing in mind that *Acanthia lectularia* is sometimes mulcted of its ingested blood by another animal, I continued my researches on the enemies of *O. moubata*, and discovered an insect which preys on them, catching them and sucking by means of its powerful piercing proboscis the blood with which they have filled themselves. This insect (called by the natives Ochindundu—"the striker") is entirely black except the first two pairs of legs, which are bright-red and provided with curious paddle-like structures, evidently designed for holding securely the tick upon which it feeds. I shall not attempt a detailed description of the "Ochindundu" here, as a specimen has been sent to the British Museum for determination, and it is hoped a report on it will soon be received.

A B

FIG. 2.—The Ochindundu. A, dorsal surface; B, side view, showing the position it assumes in the act of sucking blood from an Ochihopio (*O. moubata* Murray). Natural size.

I have watched the "Ox Bird" (*Buphaga africana*) and also a white egret picking ticks off of game and cattle. Whether *O. moubata* has a special vertebrate enemy or not I have not learned.

SYSTEMATIC POSITION.

Ticks belong to the class *Arachnoidæ*, order *Acarina*. In this order the *Ixodinæ* are divided into two sub-families, the *Ixoda* and the *Rhipicephala*, each of which contains several genera. The *Argasinæ*, however, to which belongs the tick under discussion, consist of but two genera, *Argas* and *Ornithodoros*. The Argasina are known by having the rostrum inferior, and both dorsal shield (scutum) and pulvilli of tarsi wanting. A synopsis of the family is as follows:

Argasinæ—

(1) Body usually flat; thin at edges; without deep ventral grooves; eyes absent.....*Argas*.

(2) Body thick at edges; ventral grooves anal, preanal, and postanal; eyes sometimes present.....*Ornithodoros*.

DESCRIPTION.

Fam. *Argasinæ*.

Ornithodoros moubata Murray (1877).

Body thick and rounded at the edges. Tips of palpi not visible from above. Preanal grooves we

marked. ♀ larger than ♂, but sexual dimorphism not striking. Color brown. Eyes wanting.

♀. The body is deeply furrowed both on the dorsal and ventral surface. In younger specimens the furrows are much less marked, especially on the ventral aspect. The shape of the body, which is thick and rounded at the edges, is roughly oval, flattened, and with the dorsal surface more rounded than the ventral. The tegument is finely mammillated, giving it a leathery appearance, the shagreening extending over the entire surface of the tick. Scutum absent. Rostrum inferior, close to anterior margin of body, and hidden from above by a projecting fold of the tegument. Palpi free, short (tips not visible from above), filiform, four-jointed, and placed on either side of the haustellum. Close scrutiny of the supracoxal fold of the first pair of legs fails to reveal any trace of eyes. Anus half-way between middle and posterior margin of ventral surface. Preanal grooves deep. Sexual opening nearer anterior margin than middle of ventral surface,[1] lying behind the haustellum. Tarsi without pulvilli, legs ending in two simple hooks. A few minute bristles are scattered over the surface of the tick, varying greatly in number and position in different specimens. Color ranges from yellowish-brown to dark, greenish-brown.

Var. *a*.—Dark yellow.

Var. *b*.—Dull gray.

Lat. 6–7 mm.

Long. 8–9 mm.

Habitat. Bihé, Angola, W. Africa (5200 feet). Neumann records it from Angola and many other African localities, ranging from Egypt to the Transvaal. He remarks concerning it "*paraît bien plus commune que le type*[2] *pourvu d'yeux.*"

Observations. The above description, which is doubtless very imperfect, was drawn up (the writer not having access to the published descriptions) from several adult female ticks collected at Bihé, February, 1905. One of these was sent to the British Museum and pronounced to be "identical with specimens in the Museum labeled *O. moubata* Murray."

ANATOMY AND PHYSIOLOGY.

Only a preliminary dissection of several ticks has been made as yet. The common ganglionic mass (brain), alimentary canal with its diverticula, etc., are well seen. The mouth parts too are of great interest, but a description of these with the internal anatomy would make this paper too lengthy, and must wait till a future occasion for consideration. Several physiological questions connected with their tenacity of life, longevity, power of existing without food for almost incredible periods of time, etc., are of the greatest interest. The mechanism of digestion is another question of importance. While feeding, and for some time afterward, a whitish secretion which when dry resembles whitewash escapes as feces from the anus. The elaboration of this, whether within the cells of the ventriculus or in the Malpighian tubes, is a point for study. It has been stated that the cells named when the tick is filled with blood change their shape, allowing the passage of the digested food into the body cavity and finally into the lumen of the ventriculus, but that the cells still retain a certain residue of crystals or concretions from the excreta. It is hoped that full investigations on these questions and the exact method of transmission of tick fever, whether mechanically or by a metamorphosis of the parasite in the tick's body, will be made by those in a position to solve such problems.

PATHOLOGICAL IMPORTANCE.

Ixodiasis (even that due to one acarus) is a subject too extensive to be more than touched upon in such a paper as this. I have on several previous occasions discussed at some length the rôle of *O. moubata* in the dissemination of spirillosis, and a few brief notes on tick-transmitted diseases must suffice here.

The bite. The bite of the tick is very painful, as I can personally testify, the swelling and irritation (in the case of Europeans especially) not subsiding for days. The wheals are hard, raised, and itch and swell most disagreeably if scratched, and this even a week after being bitten. The bite of young ticks (nymphæ) is said by the natives to be more severe than that of the adults. I have experimented on my own person with the ticks, and am convinced that this is generally the case.

Tick spirillosis. In another paper I have shown that microscopically verified spirillary fever has

[1] Not including the projecting hood of tegument which conceals the capitulum when the tick is viewed from above.

[2] *O. savignyi* Aud.

been reported from such widely separated regions as South China, Sumatra, India, Europe, America, and various quarters of Africa (Angola, Uganda, etc.). Ross and Milne in Uganda demonstrated in November, 1904, the characteristic spirillum in several undoubted cases of tick fever; the writer showed by charts, etc., published in April, 1905, that the disease is clinically identical with relapsing fever, both in respect to the temperature curve and the incidence of the parasites in the blood; and at the last meeting of the British Medical Association Dutton and Todd confirmed all these observations, and in addition showed that the parasite may be transmitted by the bites of young ticks hatched

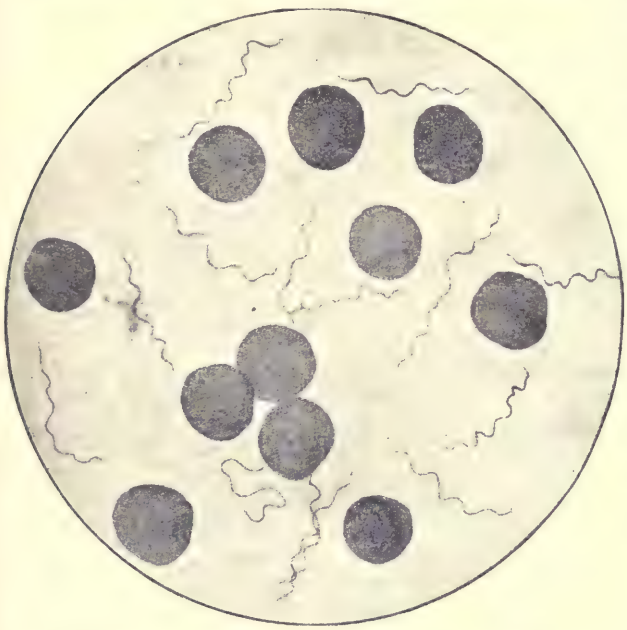

FIG. 3.—*Spirochæte obermeieri*. The parasite of relapsing fever, carried by *O. moubata*. Blood film from the author's case.

from eggs laid by infected parents (which has its analogue in the transmission of Texas fever of cattle), and that it is only uniformly pathogenic to man and monkeys. This parasite, which is a spirochæta rather than a spirillum, is morphologically identical with the parasite of the relapsing fever of temperate climates (*S. obermeieri*), but arguing from biological analogy one expects that it will prove to be different from those carried by other hosts. In view of the work of Schaudinn and others the probability of its being related to the *Flagellata* occurs to one. In my first case the parasites were very plentiful during the attacks of fever, but in a subsequent case they were much fewer in number. They measured on an average about 30 by 0.1 microns. I failed to observe multiplication in the condensation water of hemoglobin agar, and the cultures died out in a few days. The incubation period from the time of being bitten by an infected tick to the onset of the disease is said to be about a week. The symptoms vary. In my case above referred to I noted no rigor or vomiting, but there were pains in the back and limbs, malaise, and the temperature and sudden recovery were entirely characteristic of relapsing fever. That immunity may be acquired is proven by the fact that my second case of infection with the parasite showed no symptoms whatever.

Other Possible Rôles of O. Moubata.—The suggestions of Christy and the statements of Feldman as to this tick being an intermediate host of *Filaria*

FIG. 4.—*Filaria perstans* Mans. Possibly transmitted by *O. moubata*. Blood of West African negro. Author's case.

perstans have yet to be critically examined. The inference that blackwater fever may be due to a human piroplasm carried by ticks also deserves consideration.

OTHER NOXIOUS ACARINES.

Ticks with severe bites producing painful symptoms have been reported from different countries. *Leptus autumnalis* is too familiar to need mention. *Trombidium thalsahuate* from Mexico also causes trouble, especially infecting the eyelids, axilla, navel, etc., and the fatal flood fever of Japan (Akamushi or Kedani) is said to be caused by a mite similar to the above. Again, the so-called "Atriplicism" of China is said by some to be due to a mite which lives on *Atriplex littoralis* and not to the poisonous effects of the plant itself. *Tetranychus molestissimus* of Argentine and Uruguay is credited with causing a skin disease accompanied by fever, while *T. telarius* causes pustules and swellings, and *Pediculoides ventricosis* is known to

set up erythema, itching, swelling, and fever. While the claim for *Dermacentor reticulatus* as the carrier of the parasite of spotted fever has not been substantiated, yet the suggestion is one of interest. *Argas persicus* is, of course, the classical instance of a fever-producing tick. *Argas reflexus*, although generally found on pigeons, may infect man and cause angry erythema and edema. The bite of *Ornithodoros turicata* in Central America is very severe and not seldom followed by grave symptoms. *O. talaje*, also of Central America, *O. tholozani* of Persia, and *O. megnini* of Mexico are all pathogenic to man. Other acarines have been known to invade the cavities and tissues of the body. *Tyroglyphus siro* and *T. longior* have been found in the urine and pus of man. *Glyciphagus prunorum* is not seldom found in the stools. The eruption occurring on the feet of coolies in Indian tea plantations, while generally attributed to rhabdite larvæ of *A. duodenale*, is thought by some to be caused by the presence of *Rhizoglyphus parasiticus*. Finally, *Nephrophagus sanguinarius* has been found in the urine of several fatal cases of hematuria in Japan and probably lives in the kidneys. Turning now to similar parasites infesting animals we find the list too long to even enumerate. Animal piroplasmosis, which is of the greatest economic importance, has been shown to be carried by ticks. One need only advert to *Piroplasma bovis* carried by *Rhipicephalus annulatus*, *R. evertsi*, and *R. auctralis*, and to *P. canis* by *Dermacentor reticulatus* and *Hæmophysalis leachi* in order to bring to mind the researches of Smith and Kilborne, Koch, Nuttall, Laveran, etc., on these subjects.

In conclusion it would seem that acarines as transmitters of spirilloses, piroplasmoses, and possibly filariasis and other diseases threaten to rival the *Culicidæ* in their importance to tropical pathologists. And while the study of tick-transmitted diseases has of late attracted a great deal of attention, still the subject is as yet in considerable confusion and further work is urgently required. It is to be hoped that medical men in the tropics will respond to the request of the directors of the British Museum and make and forward careful collections of the ticks infesting their districts, at the same time recording accurate observations regarding the transmission, symptoms, distribution, and parasitology of the tick fevers of men and animals which they may meet.

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* * *

NOTE ON AN INSECT FOUND BY DR. F. CREIGHTON WELLMAN PREYING UPON A TICK (ORNITHODOROS MOUBATA, MURRAY) AT BENGUELLA, ANGOLA, W. AFRICA.

The above insect is a specimen of *Phonergates bicoloripes* Stal, a species of bug (order Hemiptera-Heteroptera) belonging to the family Reduviidæ, the members of which are predaceous and as a rule prey upon other insects. The following is a brief description of Dr. Wellman's specimen:

Dimensions: Length 18½ millimeters; width of thorax at base of wings 5⅓ millimeters; width of abdomen (on

which the wings when not in use lie closed one over the other like the blades of a pair of scissors) 5 millimeters.

Color, etc.: Thorax metallic purple; wings (which when closed conceal abdomen when insect is viewed from above) deep velvet black; hind legs bluish-black; front and middle femora and front tibiæ coral red, with tips of femora and base and tips of front tibiæ black; middle tibiæ brownish. The front and, to a lesser extent, the middle femora are swollen. The tips of the front and middle tibiæ are provided on the under side with large spongy pads, which enable the insect to obtain a firm grip of its prey.

E. E. AUSTEN.

British Museum (Natural History), London, S. W.
March 26, 1905.

JAUNDICE, WITH SPECIAL REFERENCE TO ITS DIAGNOSTIC VALUE.[1]

BY CHARLES E. HANSEL, M.D., SOUTH BEND, IND.

I have chosen this subject because of its practical value. The presence of jaundice is an obvious symptom which requires no great diagnostic skill to detect. An attempt to arrive at the pathology of the disease causing this condition puts our diagnostic skill to a severe test, and any aid however slight would be sufficient excuse for this paper. Probably I overrate this phase of jaundice, for I am surprised that it has scarcely been touched upon in the literature. It is true that there have been many and valuable contributions and much original research work in connection with jaundice, but the clinical value of jaundice as a symptom has received scant attention.

Every text-book on the practice of medicine has something about jaundice, especially acute catarrhal jaundice; but most of these articles should be rewritten. Osler, Strumpell, Da Costa, and Butler divide jaundice into two great classes, hematogenous and hepatogenous, while the experiments of Legg, Naunyn, Charcot, Kunde, and others have demonstrated that there is no such thing as hematogenous jaundice, because without the liver there could be no jaundice. It is true that in some instances the leucocytes have the power of elaborating granules of bile pigments from the red corpuscles, but this is of no clinical importance, as the amount is never large enough to show any staining of the tissues macroscopically, and it has been proven that the liver cell is the preponderating influence in the production of bile pigments. This brings all jaundice under one head, hepatogenous. For practical and clinical purposes jaundice should be divided, and since the terms hematogenous and hepatogenous must be abandoned, Hunter seeks to overcome the difficulty by classifying it as "obstructive and non-obstructive," or "obstructive and toxemic." This too is open to objection, because in reality all jaundice is obstructive, the toxemic variety depending upon increasing viscidity of the bile or a swelling of the mucosa of the bile-ducts, which leads to obstruction. This paper discusses jaundice clinically, hence a clinical division will assist in dealing with the subject. For the purpose of description I shall use the terms "direct" and "indirect." Direct jaundice will apply to those cases in which the original cause is within or immediately without the bile passages. All other jaundice due to causes originally remote from the liver and its bile passages—or in other words, general conditions—may be classified as indirect.

Under direct jaundice should be placed the conditions which directly impede the excretion of bile, such as foreign bodies within the ducts consisting of gall-stones, plugs of mucus, infective concretions, and particles from the duodenum. These may cause a mechanical obstruction, or secondarily set up a cholangitis which by swelling of the mucosa produces a narrowed lumen and arrests the biliary excretion. Gastroduodenitis by causing a swelling at the opening of the common duct may produce jaundice directly. Stenosis of the duct from cicatrices due to ulcerations following biliary colic, stenosis from chronic inflammation of the duct wall, and impacted gall-stones, all act mechanically in producing a direct jaundice. Adhesions of adjacent structures, tumors in close proximity, and enlarged glands in the transverse fissure of the liver cause obstruction by direct

[1] Read before the St. Joseph County Medical Society, Ind., Jan. 30, 1906.

pressure. Direct jaundice may also be caused by diseases of the liver, such as Weil's disease, acute yellow atrophy, passive congestion, cancer, biliary hypertrophy, and common cirrhosis. Rarely a direct jaundice occurs in syphilitic, amyloid, and fatty liver.

In all other causes of jaundice, while the end-result may be due to changes produced in the bile-forming or bile-excreting apparatus, yet the diseases are not primarily connected with the liver or its ducts. Coming within this class and under the heading indirect may be placed the slight and transitory jaundice due to fright, anger, anxiety, and concussion of the brain; the jaundice found in the course of scarlet fever; malaria, typhus, typhoid, relapsing, and yellow fever; ulcerative endocarditis, epidemic influenza, pyemia, and pneumonia; the jaundice resulting from snake bites, the effects of chloroform, ether, antimony, arsenic, phosphorus, lead, chloral, potassium chlorate, mercury, and copper.

It would be interesting and instructive to work out the pathology and the exact mechanism in these cases of indirect jaundice, but that would be foreign to the subject-matter of this paper. It is even necessary to go further and eliminate the entire class of indirect jaundice from the discussion, for the jaundice in these cases is of but secondary importance to the diagnostician and has rather a prognostic than a diagnostic value.

A brief description of the diseases associated with direct jaundice must necessarily enumerate only the most prominent and characteristic symptoms: Cholelithiasis, a condition which appears in women in about 75 per cent of the cases, most of them being over 40 years of age and fat. Jaundice appears in about one-half of all the cases that present symptoms, but gall-stones are often present in the gall-bladder without appreciable symptoms. According to Kehr 95 per cent of the cases which have gall-stones escape recognition during life on account of this lack of symptoms. If trouble occurs it is generally because the stone migrates; if it enters the cystic duct and remains there, or falls back again into the gall-bladder, there is a colic unaccompanied by jaundice, but if the stone should enter the common duct, whether it becomes impacted or not, there is almost certain to be jaundice with the colic. Jaundice and colic are so closely associated in cholelithiasis that Murphy says that the jaundice of gall-stones is always accompanied by colic. Moynihan is not quite so positive, but states that it is generally so. In detecting cholelithiasis, Naunyn lays especial stress upon the character of the first attack of pain; it begins in the night independently of the taking of food, is accompanied by a tender gall-bladder, and when jaundice follows it appears within twenty-four or forty-eight hours. The presence of the jaundice would eliminate most of the conditions which are often mistaken for gall-stones, viz., renal colic, floating kidney, gastric and duodenal ulcer, acute dyspepsia, appendicitis, and mucous colitis. The condition which would offer serious difficulty in differentiation would be the jaundice due to a severe gastroduodenitis, or as it is sometimes called, acute catarrhal jaundice.

In acute catarrhal jaundice the attacks of pain are not of an intense colicky character and are usually referred to some indiscretion in diet, the tenderness is less over the liver and more over the epigastrium, the jaundice appears as the temperature from the primary disturbance subsides, and it is first slight and gradually deepens, to disappear slowly in from one to two weeks.

If a stone remains in the common duct and becomes impacted the condition known as hepatic intermittent fever is set up. Quine makes the statement that a stone cannot enter the common duct, whether it becomes impacted or not, without causing jaundice. This statement has not been borne out, as both Kehr and Mayo found jaundice present in but 67 per cent of cases operated upon for impacted stone. This percentage is too small, as most of the cases operated upon had probably existed long enough to allow the duct to dilate and permit the bile to flow past in quantities sufficient to prevent absorption. If histories were more accurate, it would probably be found that most of these cases had in the beginning a slight and transient jaundice. Jaundice in cases of impacted stones is generally intermittent and may last for years. Coupled with this is persistent or intermittent presence of bile in the stools, irregular chills, fever, sweats, enlargement of the spleen, normal or slight enlargement of the liver, absence of ascites, and diminution in the size of the gall-bladder. The paroxysms often occur with such

regularity as to be mistaken for malaria. In malaria the plasmodium is found in the blood, there is an absence of colicky pains, and the jaundice is not associated with the paroxysm. Quinine should clear up remaining doubts.

Hepatic abscess may be distinguished from impacted stone by the previous history of dysentery, the jaundice being of a slighter and more muddy character and not dependent on the paroxysms, the temperature being remittent instead of intermittent, the liver enlarged and tender, a generally present leucocytosis and a clinical picture of a profound pyemia, which is absent in hepatic intermittent fever. Without the history of a previous gall-stone it is practically impossible to differentiate clinically a hepatic abscess from a suppurative cholangitis.

Among the causes of impassable obstruction of the common duct, other than gall-stones, are the cicatricial contraction of ulcers; narrowing of the lumen due to chronic inflammation; and pressure from without due to tumors or adhesions of the adjacent structures.

The jaundice in cases of impassable obstruction is continuous and not intermittent, and contrary to the conditions found when gall-stones form the obstruction we have an enlarged gall-bladder. This is according to the law first promulgated by Courvoisier and afterward verified by Mayo Robson, Ecklin, Cabot, and others, who found a contracted gall-bladder in 80 per cent of the cases of jaundice and gall-stone, and an enlarged gall-bladder in 90 per cent of the cases in which the obstruction of the common duct was due to other causes than gall-stone. These causes are generally malignant growths in the head of the pancreas or the pylorus.

Among the diseases of the liver associated with jaundice is Weil's disease or infective jaundice. In this disease there is a cloudy swelling of the cells of the liver, heart, and kidney, and in some cases a further degenerative change or fatty metamorphosis. This condition is found in young butchers, soldiers, and others who eat tainted or infected meats. The symptoms are similar to those of acute yellow atrophy, and by some it is thought to be a less advanced stage of the same disease. The essential cause of Weil's disease has been found by Jager and Banti to be a proteus bacillus. The symptoms begin suddenly with headache, malaise, high fever (103°–104°), albuminuria, jaundice on the second or third day, pains in the calves of the legs, accompanied with normal or slightly enlarged liver and an enlarged spleen. It generally lasts one or two weeks and ends in recovery.

Acute yellow atrophy is a very rare disease, characterized by an acute necrotic degeneration of the liver cells and diminution in the size of the liver. It occurs in the young, and is found twice as often in women as in men. Pregnancy and mental disturbances, such as shock, fright, or worry, are thought to be the predisposing causes of this condition. At the onset the symptoms are similar to an acute catarrhal jaundice, beginning with gastro-intestinal disturbances, slight or no fever, muscular pains, bilious urine, and a moderate jaundice. These symptoms last for a week or two, when suddenly the picture changes and severe nervous symptoms appear, beginning with headache, restlessness, and rapidly followed by delirium, coma, and death. During the course of acute yellow atrophy the liver rapidly diminishes in size, and leucin and tyrosin are found in great quantities in the urine. Weil's disease differs from acute yellow atrophy by the enlargement of the liver, the higher temperature, the absence of leucin and tyrosin in the urine, and the tendency to get well.

In passive congestion of the liver there is a chronic jaundice, not deep but more of a muddy character; a slightly enlarged liver accompanied with some tenderness, but no acute pain; occasional diarrhea alternating with constipation; nausea, infrequent vomiting, depression of spirits, loss of strength, and in protracted cases hemorrhoids. Passive congestion is always secondary to some lesion of the heart or lungs, or in rare instances to an intrathoracic growth pressing on the inferior vena cava. The diagnosis of passive congestion rests upon the finding of the central lesion.

Next in order comes hypertrophic biliary cirrhosis. This occurs in the young and is never seen after 40 years of age. Alcohol is of no importance in its etiology. Rolleston believes that an infection of the bile-ducts either from the blood or the duodenum is the principal cause. This view is held by numerous French observers, who unite on the infection theory but differ as to its source.

Clinically, biliary cirrhosis is distinguished by a

chronic and continuous jaundice without a complete absence of bile pigments from the feces; enlarged liver and spleen, progressive malaise, periodic attacks of abdominal pain and fever, which are followed by an increase of jaundice. These exacerbations increase in frequency as the disease advances, and are not connected with any history of cholelithiasis. Death usually occurs from some intercurrent disease, hepatic insufficiency, or the development of icterus gravis.

Obstructive jaundice with enlarged liver may be differentiated from hypertrophic cirrhosis by the continuous absence of bile from the stools, the absence of splenic enlargement, and the enlargement of the gall-bladder.

Chronic jaundice due to calculus occurs later in life; the spleen is not enlarged, or only slightly so. There is a history of cholelithiasis, and the pain is much more severe than in biliary cirrhosis.

The jaundice of portal or common cirrhosis is often difficult to distinguish from that of biliary cirrhosis, but the jaundice of common cirrhosis is rarely as marked or as common. The disease occurs in people past the middle period of life, usually with an alcoholic history. In the atrophic form the liver is small. The spleen is but slightly enlarged. The caput medusæ is a common symptom. There is a history of dyspepsia associated with hematemesis, progressive asthenia, and in the later stages ascites. During this stage of common cirrhosis there may be trouble in distinguishing cancer of the liver. The presence of primary cancer elsewhere, the enlarged glands above the clavicle, the more rapid cachexia, the association of an enlarged hard and nodular liver, with ascites and jaundice, would be in favor of cancer.

I will not dwell upon the jaundice which is occasionally found in syphilitic, amyloid, and fatty liver, because its presence is so rare as to be the exception and not the rule.

In recapitulating we may summarize as follows:

1. Jaundice due to gall-stones is accompanied by colic.

2. Jaundice with colic is due to gall-stones.

3. Chronic obstructive jaundice with an atrophied gall-bladder is generally due to gall-stones.

4. Chronic obstructive jaundice with a dilated gall-bladder is due to causes other than gall-stone, usually a tumor of the pancreas or the pylorus.

5. Repeated attacks of jaundice, in a patient who is well in the intervals, point to gall-stone or gastroduodenal catarrh — painful when due to stones, and painless when caused by the catarrh.

6. Persistent jaundice with bile pigments in the stools, accompanied by enlargement of the liver and spleen and no ascites, indicates biliary cirrhosis or passive congestion.

7. Jaundice and ascites combined may be either common cirrhosis or cancer of the liver.

8. Jaundice, ascites, and enlargement of the liver are almost pathognomonic of cancer of the liver.

STERILITY IN WOMEN: ITS CAUSES AND MANAGEMENT.

BY EDWARD A. SCHUMANN, M D,
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One of the most puzzling and unsatisfactory conditions presenting itself to the physician is sterility. It occurs in all classes of people, is a source of profound unhappiness, and in many instances is the direct cause of the violation of the marriage tie with the grievous social upheavals which naturally follow. From 10 to 12 per cent of all marriages are sterile. In many cases the fault is with the male, thus diminishing the percentage of sterility due to the female.

The ability of the husband to procreate should always be ascertained before proceeding to the relief of conditions in the wife which are presumably the cause of the barrenness. Many women have been subjected to severe and mutilating operations for the relief of sterility when in reality pathological conditions in the husband are solely responsible. The potency of the male having been established, then the female is studied with regard to effecting a cure. Sterility in women may be complete or absolute, or incomplete or temporary.

Absolute sterility is that form in which the reproductive organs are unable to perform their functions, either by reason of congenital defects, destructive pathological processes, or surgical operations. Among the congenital defects are absence of all or any part of the genital tract, rudimentary and undeveloped organs, or inoperable atresia. In the group of cases due to destructive disease may be mentioned pyosalpinx and oöphoritis, in the course of which the histological structure of the ovaries and tubes is destroyed, or so altered by subsequent sclerosis that fecundation is impossible. A separate class may include cases in which the ovaries and tubes, with or without the uterus, have been removed. All these conditions necessarily render the woman absolutely and hopelessly sterile.

Sterility is incomplete or temporary when it is due to faulty nutrition on the part of the woman; to the results of inflammation of the genital tract, not so marked as to cause entire destruction of functioning tissues; to neoplasms with their accompanying mechanical and organic changes; or to some defect in the nerve supply to the pelvic organs. These cases all offer some hope of relief, and form the subject of this paper.

Defects of nutrition may in a broad sense be made to include those constitutional diseases which do not specifically affect the genitalia, but by reason of their intoxication or systemic disturbance may indirectly affect the reproductive functions. Potent factors of this class are tuberculosis, rachitis, the high-grade anemias, chronic cardiac disease, cirrhosis of the liver, kidney, and so on.

Obesity also is a prominent causal agent in the production of sterility. Of especial importance is that form of obesity seen in markedly anemic women, and due to faulty metabolism. The accumulation of fat about the external and indeed the internal genitalia seems to interfere in some obscure manner with their function. The exanthematous fevers, too, seem to play a rôle in the production of sterility. The pathology of this especial form is not understood. Pruritus vulvæ and vaginismus are the typical diseases due to errors of innervation of the genitalia. Their etiology remains obscure.

Psychic incompatibility as a cause of sterile marriages has been disputed, but that such conditions may be causative seems to be borne out by the facts. The marriage of Napoleon and Josephine is probably the most notable example on record.

Dyspareunia is a common and perfectly logical cause for barrenness. The pain on coitus may be due to lesions obstructing the lower parts of the genital tract, as hypertrophy about the vulva, partial atresia of the vagina, and neoplasms which encroach upon the vaginal lumen.

Inflammatory diseases and such sensitive tissues as are present in urethral caruncle are also ordinary causes of this affection. Inflammatory disease of the genitalia may, while not totally destroying the histological structure of the tissues, so alter and distort their anatomical relations and the harmony of their physiological action as to produce an intractable, but in many cases curable, sterility.

It must be understood that to have the procreative function normally developed all parts of the genital mechanism must act in unison. The tunica albuginea must rupture and permit the escape of the mature ovum; the fimbria of the Fallopian tubes must have their epithelium intact to wave the ovum into the tube by means of the cilia; the tube must be patulous and have its epithelial lining healthy, so that the ovum may be propelled onward toward the uterus; the endometrium must be healthy in order that irritating acid secretions from the utricular glands may not destroy the ovum or the spermatozoa. The endometrium must also be in such condition that the ovum if fertilized may find an attachment upon its surface. The cervix uteri must be patulous in order that the spermatozoa may ascend. The vagina must not be bathed in pus or acid leucorrhea, or the virility of the spermatozoa will be destroyed before the uterus is reached.

It is clear that in so complicated a mechanism a large variety of pathological processes, themselves slight and unimportant, may, for a time at least, prevent the proper continuity of the generative cycle, and produce sterility.

Sclerotic changes in the ovary with thickening of the tunica albuginea, or a mass of adhesions binding the organ down, may prevent the escape of the ovum, and may result in the formation of a small hematoma, which in turn may become in-

fected and be a source of further disintegration of the ovarian tissues. Ovarian abscess or hemorrhage into the medulla of the organ may abrogate its functional power. A few adhesions may close the abdominal ostium of the tube, a hydrosalpinx, or worse, a pyosalpinx, may completely close the avenue of escape of the ovum from the general peritoneal cavity to the tubes. Catarrhal or purulent inflammation of the tubal mucosa may destroy the ovum before it passes through them, or by impeding the normal action of the cilia prevent its passage through the tube. Metritis of marked types usually causes sterility, as do the severe types of endometritis. The disease known as membranous or exfoliative endometritis is usually a cause of permanent sterility. The result of inflammation lower in the genital tract has already been discussed.

The conclusion must be reached that a very large proportion of all cases of acquired sterility are due to the direct or remote results of inflammatory change. It is this group of cases which, next to those in which the trouble is due to malposition of the uterus, yield the best results to careful and discriminating treatment. Neoplasms of the genitalia as a cause of non-fecundity are purely mechanical in their action. Ovaries the seat of fibromata or sarcomata will not produce ova. Uteri the seat of submucous fibromata or advanced carcinoma offer no resting-place for the impregnated ovum, or indeed by reason of their irritating discharge may destroy the virility of ovum or spermatozoa, or both, before impregnation has occurred.

Uterine tumors are not necessarily a cause of sterility. Many cases occur in the practice of every gynecologist in which large fibroid tumors and early carcinomata have been associated with normal pregnancy. It may be said that tumors of the vulva and vagina may by their presence prevent coitus and so act as a bar to conception. Exceptions to this are, however, common enough, case after case being recorded in which the mere deposit of semen about the vaginal outlet has been sufficient to result in impregnation. Unless the functional ability of the organs is destroyed by the growths, neoplasms play a relatively small part in the production of sterility. Errors in position or form of the uterus—the various flexions and versions of which that organ is so commonly the seat—form a class of cases in which sterility is a common symptom, and which are most productive of happy results from intelligent treatment. Possibly the most common variety of malformation is pathological anteflexion. When well marked this condition is usually accompanied by sterility, due either to the altered direction of the cervix in cases of cervical anteflexion, to the obstruction in the cervical canal which interferes with the ingress of the spermatozoa, to the generally undeveloped condition of the genital organs, or most frequently, perhaps, to the accompanying chronic inflammation of the mucous membrane of the cervix and body of the uterus (Penrose). The condition is one in which appropriate treatment will very commonly result in a cure.

Next in importance to anteflexion is the study of retroversion. This is especially true in long-standing cases with adhesions binding the uterus firmly down to the cul-de-sac of Douglas, and in which the accompanying nervous phenomena are marked. While the backward position of the uterus may prevent the entrance of spermatozoa, it is most likely that the passive congestion and chronic endometritis coincident with the prolonged malposition are the chief factors. The ovum and spermatozoa find themselves in a hostile environment and are unable to discover a point on the engorged and hyperplastic endometrium suitable for the placental site. In all these cases the prognosis is good. Prolapse of the uterus is usually a hopeless cause of complete sterility, yet cases are reported in which fecundation occurred in a completely prolapsed organ. The cure of the prolapse gives a fairly good hope of subsequent fruitfulness, unless the descent is of such long standing that irreparable changes in the vascularity and uterine mucosa have taken place.

The inexplicable phenomenon of superinvolution may be classed with malpositions. In these cases the normal involution following pregnancy or miscarriage goes on until the organ is in a state of atrophy. The cause of superinvolution has not been determined. It has been attributed to excessive hemorrhage during labor, to wasting disease, and to pelvic peritonitis occurring during

the puerperium. It is usually accompanied by absolute sterility, with a very dubious prognosis as to cure.

The diagnosis of the cause of sterility involves the securing of an accurate detailed history from the patient. Especial attention should be paid to the character of the intercourse, the compatibility of the couple, and the history of some previous inflammatory disease affecting the pelvic organs. Careful pelvic examination will reveal any apparent lesions of the genital tract. Systemic physical examination will detect the presence of any constitutional disease which might be a factor. Should there be no assignable cause for the condition, the potency of the husband must be ascertained and the semen carefully examined for living spermatozoa. For obvious reasons it is a matter of great difficulty and delicacy to examine the seminal fluid, and for this reason the sterility in the wife should be eliminated before the husband is taken into consideration. But unless there are found distinct pathological conditions in the wife which will account for the sterility, treatment should not be undertaken until the fruitfulness of the husband has been proven.

The prognosis of sterility naturally varies with the etiology. Congenital absence of any of the fundamental organs of generation, irremediable atresia of the genital tract, and destructive inflammatory lesions render the condition hopeless. In these cases of chronic inflammatory disease, when portions of ovarian tissue remain normal and when one or both tubes remain patulous, or can be rendered so by cosmetic operation, the prognosis is generally hopeful if correct surgical measures are employed. The group of cases due to displacements of the uterus or its appendages, minor inflammatory lesions, as that of endometritis or endocervicitis, or to constitutional disturbances, offer the most favorable prognosis, and a very large proportion of these women are completely cured. When the condition is due to deficient innervation of the genitalia, as in pruritus vulvæ or kraurosis, the prognosis must be guarded, as these cases are a law unto themselves and the result can never be foretold. The treatment of sterility must of necessity be that of the associated and causal lesions, and must be varied to suit each individual case. In those patients who are absolutely sterile medical skill is of no avail, and the physician can only be of assistance to the unfortunate patient by combating, with teachings and argument, the severe mental depression caused by the ever-present knowledge that the raising of a family is forever denied her.

The shock by the sudden announcement to an apparently fairly healthy woman that she will never bear children has in many cases resulted in attacks of hysteria and melancholia, often terminating in incurable insanity or even suicide. A patient should never be told she is barren until a painstaking study of the case has proven the fact incontrovertibly true. The practice of physicians after a casual examination informing their patients that they can never bear children is deplorable. It should always be remembered that the desire for maternity is the strongest impulse animating a normal woman, and cases of supposed sterility should be dealt with accordingly. In no branch of medical endeavor is the careful scrutiny of the history of more importance than when attempting a systematic treatment for the relief of the condition of sterility. Any points which may throw light upon a hereditary tendency to tuberculosis, to disease of the brain or spinal cord, as locomotor ataxia or paresis, are of the greatest value in formulating a plan of treatment. The physical life of the patient should be closely scrutinized. What infectious fevers she has passed through, what debilitating illnesses, her marital relations, whether the sexual sense is present in low or high degree, the compatibility of the patient and her husband—all these may be of great importance.

The physical examination must be complete. The condition of the internal organs, the presence of organic disease of the brain or cord, the blood picture, must be carefully investigated as correlative to a very thorough examination of the genitalia themselves. Naturally, since the number of cases of sterility due to disease or malformation of the genital tract far exceed those due to all other causes combined, the gynecological examination should be detailed and systematic: no point which may even remotely throw light upon the diagnosis should be overlooked. The diagnosis having been made and a prognosis expressed, the treatment

must be considered. There is a certain large group of cases in which, while no true abnormality exists, the cervix is somewhat elongated and the vaginal walls are relaxed. This results in very deep fornices, especially well marked posteriorly. It is easily conceivable that the semen may be deposited in the deep posterior vaginal fornix and be unable to enter the cervical canal for purely mechanical reasons. In these cases relief sometimes results from having the woman assume the exaggerated knee-chest position for half an hour immediately after coitus. This treatment was suggested to the writer by Dr. Charles E. Penrose, who states that he had treated successfully two cases in which sterility had persisted for over five years of marital life. In each case the patient conceived, and later was delivered of a living child. Recently the writer was consulted by a young woman of robust health who had been married over a year, and though both husband and wife were extremely desirous of having children, there had as yet been no evidence of pregnancy. Examination revealed no abnormality in the genital tract save the deep fornices before mentioned. The knee-chest position was suggested, with the result that within three weeks the woman conceived, and is now progressing normally in her pregnancy.

When constitutional disease is the exciting cause of sterility it should be treated upon general principles, to which may be added suggestion by keeping the possibility of future fecundation always before the mind of the patient. When the sterility is due to malpositions of the uterus, appropriate surgical treatment should be instituted. In the cases of anteflexion, probably the most efficient treatment is a dilatation of the cervical canal for fifteen minutes, with or without supplementary curettage of the uterus if indicated by the presence of endometritis. The dilatation should be performed under general anesthesia, and should be followed by the introduction into the uterine canal of a hard-rubber stem pessary, or a Wylie drain. This should be left in position for ten days with the patient in the recumbent position. At the expiration of this period she may resume her ordinary mode of life.

The treatment of backward displacement of the uterus has not yet been simplified to a universal technique. It may be stated that when retroversion is a cause of sterility it should be corrected regardless of other symptoms or absence of symptoms produced by it. The manner of restoring the uterus to its normal position rests with the individual operator. Any one of the enormous variety of operations will answer provided it fulfils its purpose and does not mutilate the uterus or its appendages. Prolapse must of necessity be corrected. When there is present atresia of the genital tract it should be treated operatively in an appropriate manner. Inflammatory lesions and neoplasms must be considered in their proper relations and treated accordingly. It is, of course, important when operating for the relief of sterility that every endeavor be made to preserve at least some functionating ovarian tissue, together with a patulous canal from the ovary to the uterus along which the ovum may be propelled. Pruritus vulvæ and such painful affections as urethral caruncle, when they produce sterility by reason of dyspareunia, must be eliminated. In certain cases the instillation into the vagina of a solution of cocaine immediately before intercourse may overcome the difficulty. Care must be taken not to form a cocaine habit. Pruritus vulvæ must be regarded as a symptom until examination has proven it a neurosis. Its treatment is unsatisfactory, but Hirst has lately reported cures of three cases by a resection of all the sensory nerves of the vulva. The treatment of barrenness due to disease of the nervous system must be directed to the special disease lesions causing the disorder.

It may be said in conclusion that though on the surface sterility appears one of the most hopeless affections the physician is called upon to treat, it may easily yield to remedial measures, provided the cause is accurately determined and the treatment intelligently and persistently directed toward the removal of that cause.

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THE PROGNOSIS OF PULMONARY TUBERCULOSIS AS DETERMINED BY THE MORPHOLOGY OF THE TUBERCLE BACILLUS IN THE SPUTUM.[1]

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[From the Laboratories of the Jefferson and Philadelphia Hospitals.]

Any one who has examined a large number of specimens of sputum, especially those containing the tubercle bacillus, can attest to the multiplicity of forms manifested by this organism.

According to Coplin, who made an exhaustive study of the tubercle bacillus, the bacterium varies from 1.5 to 6 microns in length, and from .2 to .5 in thickness.

Thick, thin, long, short, branched, beaded, and fragmented forms may be seen in the same specimen. We may find some of the thick forms which are very short, and long forms may attain a size of 10 microns. Thin bacilli are generally beaded or fragmented, and may attain the same size as the thick bacilli. Again, we may have the short organisms so small that they are almost coccoid. By some a fragmented bacillus is considered the same as a beaded organism. According to the writer a fragmented form of the bacillus consists of two or more rod-like bodies, a long and short, or of equal size, making up one bacillus. In the beaded organism these beads are more or less coccoid, taking at least four to make one organism, and when eight or ten are found the appearance to a streptococcus is marked.

The real significance of the beaded, branched, and fragmented forms seems controversial, but from studies made by different observers it appears that they represent degenerated varieties brought about by insufficient pabulum. Besides the differences noticed in the morphology of the organism, there is also a marked variability in the tinctorial reactions—that is, after the application of a strong solution of a mineral acid following the stain (carbol-fuchsin), some bacilli will remain darkly stained and others will be only lightly tinged.

Craig (MEDICINE, June, 1897) in an article bearing upon the morphology of the tubercle bacillus in the sputum seems to think that the beaded appearance of the organism in the sputum is most often found in acute, rapidly advancing cases of tuberculosis. In two cases of slowly advancing disease long filamentous forms were found, and in one instance of rapidly advancing disease true branched forms were observed. He claims that it is impossible to study the branching of this organism without becoming more and more convinced that the tubercle bacillus may be of mycelial origin. In a later article (*Medical News*, Feb. 25, 1905) Craig, in commenting upon the morphology of the tubercle bacillus in relation to the prognosis of pulmonary tuberculosis, claims that the moisture and heat of the tropics enable the organism to develop more luxuriantly. Granting that it is also a well known fact that the disease runs a rapid and fatal course, if anything can be gained from the morphological appearances, the organisms seen in the sputum multiply rapidly and increase in size. Long filamentous forms are very common, and at least 75 per cent of sputums show them. The long forms stain well, but often present a beaded appearance; they are generally slightly curved, or possess a deeply stained dot at one end, appearing somewhat broader than the organism, giving it a club-shaped appearance. Very short organisms are often present, and are generally thicker than the long ones. In 80 per cent of sputums he claims branching forms are present, which develop from what he calls a budding form. In two-thirds of sputums are long rods in which at one or more portions there occurs a distinct knob or bud, which stains deeply. Some have two or more branches, the parent organism being more resistant to acids than the unbranched parasites. Sometimes the appearance of the actinomyces is suggested by the branched forms forming an interlacing network.

Goggia (*Annali dell Inst. Maragliano*, i, No. 1; *Journal of the American Medical Association*, Aug.

[1] Read by title before the Pathological Society of Philadelphia, April 12, 1906.

20, 1904, p. 579) summarizes his research upon the morphology of the tubercle bacillus by saying that the predominance of aberrant and necrobiotic forms of tubercle bacilli in the sputum is an encouraging sign, as it indicates that the organism is working rapidly in its own defense.

Chiesi (*Gazzetta degli Ospedali e delle Cliniche*, Aug. 14, 1904) claims that of twenty-four cases of tuberculosis, the most severe forms were characterized by bacilli occurring in the sputum which were short and easily stained, while the lighter and less severe forms showed bacilli with extensive morphological changes and poor staining qualities.

Sciallero (*Gazzetta degli Ospedali e delle Cliniche*, Oct. 23, 1904) after inoculating animals with tubercle bacilli, immunized them with tuberculin and observed that the organism assumed a number of aberrant and degenerated forms. Some were thinner and others were shorter than the typical bacterium, while still others did not take the fuchsin easily or evenly. He thinks the appearance of the morphologically distorted or degenerated forms of tubercle bacilli in predominant numbers in the sputum should be regarded as a favorable sign.

The following observations are based upon the study of 146 cases of pulmonary tuberculosis taken from the tubercular wards of the Philadelphia Hospital during the past fifteen months. The method of procedure, wherever feasible, was to examine the sputum at least once in seven to ten days. In 74 cases, before a second examination had been made, the patient died. Occasionally a patient would discharge himself by escaping over the wall, but would generally come back in a couple of weeks or sometimes sooner. During the fifteen months the studies were continued 611 specimens of sputum were personally examined. The usual technique of carbol-fuchsin for at least fifteen minutes in the cold and the after-application of Gabbet's solution was used. The prognoses given the writer were favorable, unfavorable, and doubtful.

In 109 cases the prognosis was unfavorable, in thirty favorable, and in seven doubtful. These cases were taken at random from the wards, and examinations of the sputum made until death occurred or until the patients disappeared.

As mentioned previously, 74 cases died after one examination had been made. The following table gives a good idea of the number of cases examined and the number of sputum examinations made in each case:

No. of cases.	No. of sputum examinations.	Total examinations.
74	1	74
18	2	36
7	3	21
7	4	28
7	5	35
4	6	24
3	7	21
1	8	8
4	9	36
4	10	40
1	11	11
3	12	36
2	13	26
2	14	28
1	16	16
2	17	34
2	18	36
1	21	21
1	24	24
1	26	26
1	30	30
146		611

Of the thirty favorable cases, 7 are alive at the present day, while eight have died; the remainder were discharged, or left of their own accord.

In one, in which there was tuberculosis of the testicle together with a lesion of the right apex, no tubercle bacilli were found *in the sputum after the first examination*, although thirteen examinations were made, extending over six months.

In another instance no bacilli were demonstrable in the sputum after the fifth examination, though thirteen examinations were made, the observations extending over seven months.

In a third case no organisms were present in the sputum after the sixteenth examination, although twenty-four examinations were made, extending over a period of nine months.

In the other cases tubercle bacilli persisted, though the number gradually diminished, and it took a most careful search to demonstrate their presence. In the seven doubtful cases three have died, while the remainder, with the exception of two, have passed from observation. In these two, examinations were carried on for nine months.

Of the 109 unfavorable cases, 74 died before a second examination could be made. Twenty-six died in from two weeks to six months, and six are under observation at the time of writing. The remainder (three) left the hospital in a very precarious condition.

Of these six cases, one has had 30 examinations, another 26, a third 24, two 18 each, and the sixth 16. These cases were under observation from six to nine months. As to the morphology of the tubercle bacillus, together with its tinctorial characteristics, the same peculiarities were evident to the writer as noticed by different observers.

In the favorable cases the organisms were thin, of average size, fractured, beaded or branched, and as a rule the majority stained faintly.

In several cases in which an unfavorable prognosis was given, abundant, lightly staining, extremely long forms of the bacillus were encountered.

In the doubtful cases the organisms were almost equally distributed between the light and dark forms.

In the unfavorable cases 99 contained bacilli which were long, short, and of average size, reacting very strongly to the carbol-fuchsin, or in other words staining deeply or darkly. Fractured forms were common, while beaded bacilli were also met with. In ten cases faintly staining bacilli were observed together with the dark forms. In the favorable cases in which the disease took an unfavorable turn the organisms could be seen to change their tinctorial property in becoming darker as well as more numerous. The same is true of the doubtful cases: in these, as they progressed to a fatal termination, the organisms were mostly darkly staining.

There was nothing characteristic of the physical properties of the sputum from favorable, doubtful, or unfavorable cases. Apart from the tinctorial properties of the bacillus in the sputum, it might be mentioned that the number of bacilli is greater in the unfavorable than in the favorable, as a rule, though exceptions have been noted. This is abundantly proved by the sputum of the six unfavorable cases still remaining under observation—*i.e.*, though the bacilli are long and darkly staining they are decidedly fewer in number than they were in the first few examinations.

From this series of observations it seems reasonable to suppose, when in an examination of sputum one sees palely staining bacilli which are fractured, beaded or clubbed, and of average size, that a favorable prognosis can be given in the case. On the other hand, if bacilli are observed which are short, long, or fractured, reacting intensely with the dye, one might give an unfavorable prognosis in the majority of instances.

I wish to extend my thanks to Dr. J. T. Ullom for kindnesses and courtesies shown in giving the prognoses of all the cases.

The writer also wishes to thank Drs. Wilson and Dean, resident physicians at the Philadelphia Hospital, for assistance in the accumulation of material.

SOME POINTS ON DIETARY IN DISEASE.

BY HENRY B. HOLLEN, M.D., FOND DU LAC, WIS.

In chronic heart disease diet is important and yet a subject on which many physicians have very unsettled ideas. At a meeting of the British Balneological and Climatological Society in London two years ago Schott read a valuable paper on this subject and later elaborated it in the *Lancet* of July 16, 1905.

There are two fundamental rules which should govern the feeding of a sufferer from chronic cardiac disease, viz.: (1) patients must avoid everything which excites the action of the heart; and (2) everything must be avoided which embarrasses the action of the heart. The substances which most readily cause excited action of the heart are strong coffee or strong tea, and strong alcoholic liquors. In Germany the medical men are just as strongly opposed to coffee drinking by sufferers from heart disease as they are opposed to tea drinking in England. Alcohol must be avoided as much as possible, and it must in any case be given only to patients for whom it is either indispensable as a stimulant or who have taken it for so many years that the sudden withdrawal of it might be dangerous. In such cases the best plan is to give Rhine wine, Moselle, or Bordeaux which has been matured for eight or ten years; in newer wines there is not only a larger proportion of fusel oil, but experience also shows that there still exist too many fermentable substances which may act injuriously. A tablespoonful of old Cognac brandy or whisky for some

patients and an ounce of old sherry or port for others are almost indispensable as stimulants in cardiac weakness, but if taken regularly they are capable of doing harm by producing cardiac irritability. It is very necessary to forbid the addition of aromatic substances (such as ginger) to the alcohol, for simultaneous irritability of the stomach and heart often leads to loss of appetite and insomnia.

Moderate quantities of ordinary water or milk are by far the best beverages: next in order comes tea or coffee, both of them with copious additions of milk. Patients for whom some fatty material is desirable may take cream either by itself or mixed with milk. Sterilized cream agrees better with many patients, and it has the further advantage that it is not apt to produce flatulence. Cocoa deprived of its fat can be strongly recommended, whereas chocolate is seldom found to agree well, either on account of the quantity of sugar which it contains or from the slow digestibility of cocoa fat, and the vanilla present in it often has the effect of exciting the heart. The patient should avoid taking enough to cause any considerable distention of the stomach, and he should eat nothing which is difficult of digestion or tends to produce flatulence. Effervescing beverages, whether carbonated water, champagne, or beer, for the most part disagree with patients who are the subjects of heart disease. Beer also is objectionable. Palpitation, shortness of breath, and conditions favorable to arteriosclerosis are only too often met with as after-effects of effervescing alcoholic drinks.

The generally accepted system of having three meals a day is not advisable for these patients; it is much better to take small amounts of food at shorter intervals. If they are very weak or very ill it may be necessary for them to have food every two hours, but in general food every three hours is often enough, the last meal of the day being taken two and a half or three hours before bedtime. The daily meals ought to have about the same nutritional value, because this, apart from its utility for digestion, conduces best to a uniformly beneficial effect on the heart. Soups in quantity are not advisable, as they contain extractives which may cause disturbance out of proportion to their nutritive value. Even soups with solids have but little food value in proportion to their bulk, so that no more than a moderate quantity (only a few tablespoonfuls) can be recommended. Larger amounts interfere with the taking of really useful substances. New bread, whether brown or white, and freshly baked cakes are to be avoided, for they too often cause distention of the stomach and flatulence. Toast, zwieback made without sugar, or the crust of rolls may be taken. Such vegetables as beans, peas, lentils, sauerkraut (preserved cabbage), red cabbage, leeks, onions, garlic, and celery should be avoided. Potatoes in the form of purée or simply boiled in water are to be preferred to the less digestible baked potatoes. Turnips and carrots should be eaten only when fresh and young. Easily digested vegetables may be included in the dietary.

Animal food in its various forms, especially fish and poultry, are allowable, but rich sauces or mayonnaise of salmon, lobsters, and crabs should be taken sparingly. Oysters, mussels, and game seldom do harm if fresh and prepared in a plain style, but highly smoked and salted fish or meat are objectionable because of the great thirst, which leads to copious water-drinking. Among fatty substances butter and cream are by far the best, being easy of digestion. Fat of ham or bacon is, on the contrary, to be avoided on account of its indigestibility. Hot seasonings are injurious, red and black pepper especially so; they not only produce gastric irritation and thirst, but they have a specially harmful influence on the kidneys, an influence which in cases of weak heart may lead to danger. Vegetable salads without hot seasoning, and particularly when made with lemon juice, are permissible. There are many other seasonings or spices, such as nutmeg, mace, cinnamon, and vanilla, which may do harm by their tendency to quicken the action of the heart. The same thing may be said of horseradish, which not only is apt to produce flatulence but also irritates the gastric mucosa.

Easily digestible fruit stewed with the addition of a little sugar can be recommended, particularly on account of its favorable influence on gastrointestinal peristalsis, which is often so much impaired in heart disease that obstinate constipation is the result. For the same reason raw fruits which have been peeled, such as apples, pears, apricots, peaches, and oranges, are often desirable. On the

other hand, raspberries, gooseberries, currants, bilberries, cranberries, pineapples, walnuts, Brazil-nuts, and hazelnuts are to be prohibited, for they may be injurious to sufferers from heart disease either from their indigestibility or from irritant substances which they contain. Ice in any form whatever, whether as iced drinks, fruit ices, or ice pudding, may not only cause gastrodynia in cardiac sufferers, but is also capable of directly producing congestion of the liver. Nothing should be eaten or drunk while it is very hot, as excitement of the heart's action is easily caused in that way.

Sufferers from heart disease do best on a mixed diet. With them the use of a diet consisting exclusively of meat very easily leads to the excretion of urine containing an excessive amount of dissolved solids and supersaturated with uric acid. Overindulgence in animal food appears in some cases to be the principal, if not the only, cause of irritation of the kidney, with hypertrophy and dilatation of the heart. An entirely vegetable diet is no less injurious. In order to make up the requisite amount of nutritive material such food must be taken in considerable quantities, whereby the stomach is overfilled, and apart from this the supposition that arteriosclerosis may be prevented by a dietary consisting of carbohydrates has been proved to be erroneous.

There is great diversity of opinion on the subject of tobacco smoking. Patients suffering from heart disease should give up smoking altogether or else indulge sparingly, and in the latter case use very dry tobacco and a long mouthpiece or pipe. A patient should always be informed that smoking is bad for his heart.

In the treatment of fatty heart and general adiposity, as well as in plethora, it is better not to drink at meal-times, but when it is desirable that the patients should have plenty of food there is absolutely no reason for the prohibition of drinking at meal-times, provided that the measures of precaution already described are complied with.

In arteriosclerosis the dietary plays an important part. Where vascular degeneration occurs—in gout, for instance—it is possible that the process is essentially a toxemia resulting from the presence in the blood of fermentative products arising from putrefaction of undigested food in the intestinal tract or from non-assimilation of the products of digestion which have been absorbed in excess of the requirements of the cell life of the body, to become a burden upon the excretory organs. Powell (*Cincinnati Lancet-Clinic*, April 25, 1903) points out that the individual approaching middle life, and especially those living sedentary lives, must pay special attention to diet and exercise to escape the development of vascular degeneration. Sir H. Thompson in "Diet in Relation to Age and Activity" offers the same idea. Powell gives the following diet list as one appropiate where the vascular changes of senility are present:

Soups.—All soups should be made as nutritious as possible, and any broth thickened with farinaceous material is good. Beef tea, while not nourishing in itself, is stimulating and furnishes needed mineral substances. An excess of fats in soups is objectionable.

Fish should be fresh and be eaten boiled or broiled. Oysters may be taken raw, with lemon juice and a dash of cayenne. In some cases salt smoked fish, as caviar or smoked herring, may be taken as a stimulant to the appetite and to prevent flatulence.

Meats should consist of young and tender chicken or game, sweetbread, lamb chops or cutlet, boiled ham, bacon (crisped or broiled), tender beefsteak (broiled), or Hamburg steak freshly prepared and free from adulteration with chemicals.

Eggs may be taken raw with a little sherry wine or shaken with milk.

Oatmeal, well cooked as a porridge or gruel. Sago, tapioca, and ground rice may be taken in the form of puddings made with milk and eggs and served with fruit jellies or juices. Vermicelli and macaroni are very nourishing, the addition of cheese in these cases being contraindicated, the flavoring being supplied by a proper use of spices. Bread should be at least a day old before it is eaten, and may also be served as toast or zwieback and eaten soaked in tea, milk, or water. All farinaceous foods should be thoroughly cooked before serving, that the starch granules may be broken open and rendered more easy of digestion.

Vegetables should be fresh and well cooked. All kinds may be taken if used in moderation. Cooked in the form of purées, potatoes, carrots, and spinach are especially valuable. Onions may be stewed or boiled with milk. Vegetable soups

in which these and other vegetables are incorporated are also good.

Fruits should be taken in moderation. Raw fruit, such as apples, may be scraped and the pulp eaten, but it is better to stew the fruit. A small amount of bicarbonate of soda should be added to acid fruit while cooking to neutralize the excess of acidity, as this encourages fermentation after eating.

Butter or cream furnishes the best form of fat for the aged, and should be incorporated in the other food in proper proportions.

After years of familiarity with condiments, we are apt to turn from food which, while hygienic, is not seasoned so highly as that to which we have been accustomed, and a proper use of condiments is necessary to the preparation of food for these people. Properly seasoned food may do away with the necessity for alcoholic stimulation, and thus in many cases prove exceedingly valuable. Red pepper is much better than black, and capsicum in the form of a dinner pill may be given after meals often with advantage, when there is constipation or flatulence.

Drinks such as tea and coffee may be taken if the person is accustomed to their use and moderation is exercised. Milk, plain or mixed with some mildly alkaline mineral water, like Vichy, is better. Malt liquor may be taken in moderation in some cases with advantage. Wines and spirituous liquors are not indicated except in cases of exhaustion, when a good article of brandy or whisky may be used. Plenty of good pure water should be taken at all times, and nothing will take its place in furnishing a proper vehicle for the excretion of waste products and in keeping the organs that preside over these functions in healthy working order.

When to the ordinary changes of senility are added those due to disease, the ingenuity of the physician is often taxed to the utmost to find proper food which will supply the requisite amount of nourishment, and at the same time furnish the minimum of residue in the digestive tract, and put the slightest tax on the organs of excretion. Milk may be peptonized and given in a variety of ways, as junket or whey, or in combination with various farinaceous materials, as a peptonized milk gruel. The latter form of gruel may also be prepared by using some form of diastatic extract in lieu of the pepsin, thus preparing the carbohydrate elements of the food for immediate absorption. In supplying the nitrogenous material recourse must be had to some of the forms of prepared extract of meat. Beaf tea is stimulating, but not valuable as furnishing nutriment, which may be said of many of the prepared beef extracts on the market, as they contain only extractives, and the percentage of nutriment is low. "Among the predigested meat extracts those containing peptones are widely advertised, and some of them may be used for a time, but sooner or later the peptone will disagree with the stomach, and the preparation becomes objectionable to the patient." A really nutritious preparation is Mosquera's beef jelly; this represents all the nutrient elements in beef predigested with bromelin.

In neurasthenia it is often a trying task to arrange a suitable dietary. The instability of the nervous system imposes many difficulties, and yet here, if anywhere, the maximum nutrition is required. Schwerin, in a recent paper, offers the following suggestions:

"The combination of iron with somatose seems to meet the requirements far better than any preparation I have ever used. The inorganic iron preparations are not so well tolerated in these cases as the organic. During the administration of ferro-somatose the impaired digestion, the irritable condition of the bowels, the poor appetite, and the depreciated state of the blood improve. Possibly the best results are to be obtained by using it as follows: Begin with 20 grains per dose and give four doses daily for two days; increase the dose to 30 grains for the next two days; and so on until the patient is taking 50 grains four times daily, which should be continued. In one case I prescribed 240 grains per day, which was taken for six weeks, and the patient gained steadily in every way. In my experience ferro-somatose has always been relished by the patients, even when taken for long periods. To make a solution (in which form it should always be taken) fill one-quarter of a glass or cup with boiling water, sprinkle the dose over the surface of the water, and when the powder has entirely dissolved fill the remainder of the glass or cup with milk and add a little salt."

THE SURGICAL ASPECTS OF GASTRIC DYSPEPSIA.[1]

BY JOHN B. DEAVER, M.D., PHILADELPHIA, PA.

Not so many years ago it would have been considered presumptuous for a surgeon, as such, to express any opinion upon the subject of indigestion in connection with diseases of the stomach. But when, through the daring and persistence of surgeons, diseases of the appendix were finally conquered and the hereditary terror of the peritoneal cavity had been in great measure dispelled by their achievements in the lower region of the abdominal cavity, it is in no way surprising that they next sought to determine what relief surgical procedures would bring in diseases of the biliary apparatus; and that, having demonstrated their successful application in these two portions of the abdomen, their next step was to attempt to relieve certain chronic affections of the stomach, in whose presence medicine had come to the limit of her resources, and was ready to retreat when the first convenient opportunity offered.

These remarks are not intended in any way to belittle the work that has been done, and that is still being done, by medical men in the region of the upper abdomen; for probably no one knows better than myself how much modern surgery of the upper abdomen is indebted to experimental physiology and to the painstaking, if at times inefficacious, therapeutics of the physician. It is indeed the proud boast of the physicians that men among their own number were among the first to appreciate the natural limitations of medical measures in certain abdominal diseases which have recently become amenable to surgical treatment, and that it is in reality owing to these very men that there is spread before us a field full of such brilliant possibilities of surgical triumph as exist to-day in the surgery of the upper abdomen.

I speak thus of the upper abdomen as a whole, because every surgeon of experience knows how frequently lesions of the first portion of the digestive tract and its attached glands, the liver and the pancreas, occur coincidentally. And although I have chosen to limit my remarks this evening to diseases which are more strictly gastric in character, it has been rare in my own experience for a patient to present lesions of the stomach without also presenting lesions of the duodenum, of the bile ducts, or of the pancreas. Indeed, I think that the frequency with which other lesions are the cause of, or at any rate are associated with, gastric disorders is a fact which is slow to win appreciation from the profession at large. Rarely does a patient develop gall-stones without also developing, either coincidentally or consecutively, perigastric or pyloric adhesions, which more often than not cause gastric symptoms, while the original cause of the mischief, the biliary calculi, may cause no discomfort whatever. In the same manner I am convinced that the frequency with which gastric ulcers are multiple, and with which they extend downward past the pylorus and become duodenal, is grossly underestimated. The statistics of Beinton and of Welch, still so frequently quoted, are twenty to forty years old; and records of the dead-house, as has been learned from the researches of the surgeon, the antemortem pathologist, are no longer of unimpeachable authority.

The time is past when any physician is content to diagnose a disease by naming one of its most prominent symptoms. As well diagnose appendicitis "pain in the belly" as diagnose some gastric lesion "indigestion." If there is indigestion of one kind or another there must be some cause for it, and we can no longer be satisfied with calling the disorder functional, when to every rational mind a functional derangement is but an expression of organic or structural change. Even hysteria, it seems to me, if it be a disease entity, must have organic changes as its cause, whether such changes are at present appreciable by human sense or not. And so it may be given as a postulate that if there is indigestion there must be a cause for it, and if the indigestion resists the action of diet and rational therapeutics, there must be an organic cause for it; and to remove an organic or mechanical cause, mechanical means are required.

In chronic indigestion, however, mere correction

[1] Read before the Philadelphia County Medical Society, Nov. 22, 1905.

of the diet very frequently fails to restore the gastric functions to the normal condition; and although a certain amount of comfort may be thus obtained, and although the degree of comfort is oftentimes very materially increased by the administration of drugs, it is fatuous to think that in this manner structural changes can be overcome, which have been in existence for many months, nay perhaps for several years. It is quite as logical to expect strychnine to sew up the burst artery in a case of cerebral hemiplegia, as to expect all the pepsin manufactured from all the calves that ever existed since the days of the Garden of Eden to overcome and release pyloric stenosis, perigastric adhesions, or other distortions in the region of the upper abdomen. And, therefore, we reach the conclusion that medical treatment cannot cure, although it may relieve the symptoms of permanent structural change.

It is a fact, indeed, that most advanced physicians and surgeons are in accord as to the diseases of the stomach which belong to their respective spheres, and there is really no controversy at the present day upon the main points involved. The physician, it seems to me, is in these diseases of value mainly as a diagnostician. With his stomach tube, his test meals, his inflations and percussions of the stomach, he may reach certain valuable conclusions which will confirm the symptomatology of the case, and render positive a diagnosis already tentatively proposed. The physician, however, has been prone to keep his patients under observation, trying first one plan of treatment and then another, without having any very clear idea of the lesions present, and without basing his treatment on any rational physiologic or therapeutic laws. And when the physician became at last convinced that the only hope of cure existed (and that one perhaps very remote) in the form of a surgical operation, he then turned over to the surgeon a patient who was already nearly moribund, saying to his surgical confrère: "Here's your chance; perform one of your brilliant operations on this patient, who has been starving to death under my care, and see if you can restore him to his former health as you are claiming to do." If such a patient is operated on by the too-little-conservative surgeon, and does not survive the operation, the physicians in the case wag their heads together, and resolve that they will hereafter let their patients die a natural death, without the terror and discomfort of an operation.

What the surgeon at the present day is asking, and what the enlightened physicians are granting him, is to be called into consultation not only when the physician has made up his mind that further medical treatment is useless, but at a much earlier stage of the disease, that the surgeon may have an opportunity to discuss the surgical aspects of the case with the physician, and to determine not merely whether surgery can be of any avail, but at what moment an operation shall be undertaken to give the best results.

But while I am thus insistent in urging early surgical consultation in cases such as these, I well recognize the fact that every patient will not be a suitable subject for operation, and that a suitable operation is not always applicable. A patient well advanced in years who can keep fairly comfortable by medical means, such as restriction of diet, stomach lavage, and the administration of appropriate drugs, is very likely to be better off under such treatment, and will probably be wiser to continue in it, than he would be to submit to the risk of an operation, which in any particular case might be peculiarly great. The condition of a patient's other organs, his heart, lungs, kidneys, and his general arterial system, must all be taken into consideration; but my plea is that the surgeon, and not the physician, should be asked to make the decision for or against an operation. No modern surgeon worthy of the name is content to be relegated to the position of the barber-surgeon of yore, who stood submissively by and acted as a mere mechanical appliance in the hands of the lordly physician, as this latter from the fulness of his knowledge ordered his menial attendant to bleed the patient or to stop the bloodletting for a disease of which the barber understood nothing, and to produce a result about which he cared less.

The objects for which a surgeon operates in cases of gastric indigestion may be classed under the following headings: (1) Rest; (2) drainage; (3) prevention of carcinoma; (4) removal of carcinoma; and (5) euthanasia.

1. *Rest* is the main therapeutic indication in cases of gastric ulcer without pyloric stenosis or dilatation of the stomach. The symptomatology of this condition is beyond the province of my paper

to night; but I may say in passing that it is usually for the relief of hemorrhage that the surgeon is consulted in cases of this kind. The bleeding is usually not great in amount at any one time, but by its persistence and because it is often undetected it gradually saps away the patient's strength; and is hence even more of a menace to life than is the profuse bleeding of an acute ulcer.

When a physician seeks to put the ulcerated stomach at rest, the chief means at his disposal is the abolition, either partial or total, of mouth feeding. Meanwhile the patient is given nutrient enemata. Now while nutrient enemata are a means of treatment whose value is thoroughly appreciated by the surgeon, it is one whose value is very often overestimated. The painstaking researches of Edsall and Miller[1] within the last few years have shown that, even under the best conditions, patients fed only by nutritive enemata are slowly starving to death, inasmuch as the rate of elimination always exceeds that of absorption. If this is not the only means by which nutriment is administered, if the stomach receives its quota, however small, then the fullest measure of rest is not attained, since every particle of chyme received into the stomach must pass out of it again by way of the ulcerated pyloric portion. Yet that patients who receive some food by the mouth do not do so badly as those who are prohibited entirely from this means of nutrition is shown by the familiar statistics of Greenough and Joslin.

Now what does surgery propose as a means to secure rest for such gastric lesions? Her plan is to short-circuit the ingested food, so that when it is received into the stomach it passes directly into the jejunum by an artificial opening, and never comes into contact with the ulcerated pyloric area. In surgical treatment, moreover, mouth feeding is now begun within twelve or twenty-four hours of the operation, and at the end of the week a fairly liberal diet may be allowed. On the contrary, after over a week of absolute starvation (the average time in Greenough and Joslin's cases during which patients were on nutrient enemata alone was 8.39 days!)—after over a week, I repeat, of starvation—patients treated by medical measures are then only able to increase their diet with great probability of relapse. For, as pointed out by Mayo Robson and Moynihan,[2] the ulcer in the stomach is like an ulcer on the leg; as soon as it commences to heal, the pain ceases. Now in medical treatment it is almost impossible to make the patients willing to continue their guarded diet and other remedial measures when once the pain has ceased; and as the cessation of pain by no means implies cure of the ulcer, relapses are frequent.

If the theory, then, of the surgical treatment is better than that of the medical, how about the practice? What do the physicians accomplish by medical treatment in cases of chronic gastric ulcer, and what has surgery done?

In this, as in every question of treatment, we have both the immediate and remote results to consider; both the recoveries (from medical treatment or from operation) and the cures. Most strictly medical treatises are discreetly silent as to the immediate mortality under medical treatment. Mayo Robson and Moynihan, in 1904, stated that under medical treatment the mortality was from 20 to 50 per cent.

Now the average death-rate for gastroenterostomy or Finney's pyloroplasty, which are the operations most frequently employed in these conditions, is as low in the average at the present day, in the hands of competent surgeons, as 5 per cent. Among the last forty gastroenterostomies which I have myself performed, there has been only one death, or a mortality of 2.5 per cent. It must be remembered, moreover, that the figures for the surgical side of the argument include not only operations done to procure rest to the stomach, but also many operations done on stomachs very extensively diseased, dilated, distorted, or contracted by chronic ulceration; and that the operative mortality is constantly lessening as surgeons become more expert, and as their experience increases.

In regard to the cures, a decision in figures is not so easily reached. Few series of cases have been followed sufficiently long to give us any accurate data; and the figures which are available apply more especially to the results of operation performed upon patients with pyloric stenosis than upon those in which there is no such obstruction.

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[1] Trans. Coll. Phys., Phila., 1902, xxiv, 225.

[2] Surgical Treatment of Diseases of the Stomach, N. Y., 1904, p. 177.

The figures for the former class of cases will be considered presently, and as such patients are usually more seriously ill than those without pyloric stenosis it is reasonable to conclude that the end results of operation for non-obstructing ulcer are even more satisfactory than are those of operations undertaken for gastrectasis and allied conditions.

The argument, then, for surgical intervention in cases of gastric disease where the indication is rest for the stomach, and where medical measures fail to secure the requisite results, is founded on safe premises, and justifies our conclusion that when medical means fail, resort should be had to surgical operation.

Doubtless some medical man will reply that in persistent non-obstructing gastric ulcers, where medical measures have failed, and where operation has been tried, he has known recurrence of symptoms to occur; and hence is skeptical as to the benefits to be derived from operation. Mumford and Stone, among others, call attention to this fact, and record four such cases, subjected to operation for slight degrees of pyloric stenosis. But they go on to point out that the operation done was a simple gastroenterostomy with a long loop, and that symptoms recurred because the technique was faulty. Immediately after the operation the pyloric irritation subsided, because the food was diverted from its former channel into the gastrointestinal anastomosis. But when the pylorus had regained more or less its normal state, the food again passed through it, this being the easiest and most natural channel to pursue, with the result that the gastrointestinal anastomosis contracted, and the pylorus again became ulcerated. If in such cases the pylorus had been permanently occluded at the operation, or if Finney's operation had been done, the cure would have been permanent. These are faults which we have learned within the last two years, and we no longer will allow such a series of events to occur. Among my own gastroenterostomies, two suffered from regurgitant vomiting and recurring symptoms. I again opened the abdomens of these patients, and tied off the pylorus, with the happiest results.

Now I would not be misunderstood as urging surgical intervention to procure gastric rest in every case of ulcer of the stomach. Acute peptic ulcers are frequently cured by medical means, and by therapeusis founded on the well known physiologic laws elaborated by Pawlow. But it is at times very difficult to be certain whether an ulcer of the stomach is acute or chronic. In certain instances, of course, there can be no manner of doubt that the ulcer is acute; but in other cases there may arise symptoms which are quite as acute, yet which nevertheless are due to an exacerbation of chronic ulceration. Naturally, perforation of a gastric ulcer is, on all hands, acknowledged to be a surgical disease; but in the matter of acute hemorrhage there is still dispute. My own view is that it is pure madness to operate while the bleeding is actually taking place, with any idea of finding the bleeding point and ligating it. Such bleeding is almost invariably venous, and as invariably very successfully checked by medical treatment combined with absolute rest and the local application of ice. This is the hemorrhage, as Mumford says, which comes as our first intimation that ulcer is present. But the truly alarming hemorrhages, though they are seldom large in amount at any one time, are those which occur in chronic ulceration, and which are dangerous because so often undetected, and because they sap away the life of the patient by inappreciable degrees, maintaining and even possibly originating that anemia which is characteristic of the disease. Such occult hemorrhage is of the greatest moment, and investigators who periodically call attention to the subject deserve the surgeon's warmest thanks. When such occult hemorrhage is prolonged, and recurs persistently if without regularity, operation should be done, and a cure is to be expected. When the hemorrhage is greater in amount, gastroenterostomy should also be done, to allow the ulcer to heal. It is useless to attempt to find or excise the ulcer—gastroenterostomy is sufficient. But recurrence of symptoms must be provided against, either by making the gastroenteric anastomosis amply large, by excising the mucous membrane at the site of the anastomosis; by constricting the pylorus; or by employing Finney's operation of gastropyloroduodenostomy. I have tried the last named procedure in a small number of cases, but not with any notable success. It is but just to add, however, that in the hands of its originator as well as in those of several other surgeons of experience,

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it is a method which has been proved to have distinct value in patients such as those now under discussion.

2. *Drainage.*—This is the second object of surgical intervention to which I have alluded, and is indicated in practically every case of pyloric obstruction, a state which is most frequently caused by chronic ulcer. There are very few cases indeed in which the primary gastric hypertrophy which is believed to occur persists long enough or reaches such proportions as to be self-curative. Sooner or later the stomach dilates, and like the dilated bladder in prostatic obstruction, the condition becomes steadily worse. The products of the chronic gastric catarrh, added to the natural secretion of the stomach, and the stagnating ingested food, all tend to continue and to increase the dilatation. We hear at times of an atonic dilatation. I have never myself seen such a condition, and have a very strong suspicion that careful search in such cases would demonstrate the presence of old cicatrices or adhesions, causing a narrowing of the pylorus and hence producing the gastrectasis.

What does medical treatment offer for the condition of gastric dilatation due to pyloric stenosis? Gastric lavage and a carefully regulated diet may keep some patients in comparative comfort; but proper nourishment is not received; the patients are constantly thirsty; they gradually lose weight.

The argument for timely surgical intervention as the best means of preventing carcinoma will occupy us presently, but just now I want to call your attention again to the reasonableness of surgical operation for the relief of gastrectasis and other distortions of the stomach for which drainage is the proper treatment. In this category are included, besides simple gastric dilatation from pyloric stenosis due to ulcer, the various forms of hour-glass constriction of the stomach and the distortions caused by extraneous adhesions, whether due to gastric ulcer or to biliary or pancreatic inflammations. Gastroptosis I have never observed unassociated with dilatation of the stomach, unless it was in those rare instances of splanchnoptosis in which all the abdominal viscera were prolapsed. When accompanied by gastrectasis it is the latter condition that is responsible for the symptoms, whether the dilatation be caused by kinking of the pylorus through relative shortening of the gastrohepatic ligament, or produced by coincident but independent ulceration. The proper treatment here, as in other cases of gastrectasis, is some form of drainage operation. I do not favor the operation advocated by Beyea, shortening of the lesser omentum, both because of the danger of wounding important nutrient blood-vessels, and also because, though the malposition of the stomach may possibly be relieved, the dilatation is not affected, but may increase and give rise to recurrence of symptoms.

Gastric tetany is a condition whose surgical aspects have been forcibly brought before the profession by Robson and Moynihan. According to these authors dilatation of the stomach is almost invariably the cause, and when this condition is relieved by operation a cure nearly invariably results. I have not myself had any experience with this condition, but in view of the admitted inefficacy of purely medical treatment I would not hesitate to recommend operation to such patients should they come under my care.

As has been already pointed out the mortality of operation for these conditions averages about 5 per cent; while under medical treatment the immediate mortality is 18 or 20 per cent, and the permanent cures few and far between.

3. The third object of surgical intervention to which I have alluded is the *prevention of the development of carcinoma* in the stomach. As has been well said, the time to operate to cure gastric carcinoma is while the disease is still in the stage of chronic non-malignant ulceration. I am sure there is no longer any doubt in the minds of most living pathologists that gastric carcinoma most frequently is developed from a preceding ulceration with chronic irritation of the ulcerating surface.

If chronic and rebellious cases of gastric indigestion were promptly turned over to the surgeon, and if suitable operations were done on such patients, it is my belief that there would be many fewer cases of carcinoma of the stomach observed by physicians

4. The problem of the surgical treatment of lesions which are already carcinomatous in nature is one which requires the most careful thought. Medical treatment is here even more helpless in effecting a cure than in the chronic diseases of the stomach which have already been discussed. Has there ever been a case of carcinoma of the stomach

cured with medicine? Is surgery any less helpless? I think the truthful answer may be in the affirmative, although the outlook here is by no means so bright as in non-malignant conditions.

Patients with gastric carcinomata who remain untreated, or (which amounts practically to the same thing as far as cure of the disease is concerned), or, I repeat, those who are under medical treatment alone, have an average duration of life, according to Mikulicz and Kronlein,[3] of about twelve months from the beginning of the disease. Many writers put it at less. Not only is this the duration of life, but it should not be forgotten that at the end of that time the patients under medical treatment will *all be dead.* If, then, the surgeon can show any permanent cures, and if the average duration of life under surgical treatment is longer, or at least not less than that under medical treatment, the conclusion is surely irresistible that surgical intervention is best for these patients.

I recognize the fact that occasionally when a surgeon undertakes an operation for a supposedly benign condition, he may happen upon one which is undoubtedly carcinomatous, but one which may not yet be so far advanced as to contraindicate the radical removal of the growth. But these cases are rare; and it so frequently happens that very suspicious looking indurations melt away and disappear after the simple operation of gastroenterostomy, that I should have to be very certain that the growth was really carcinomatous before I would be willing to undertake its incision. And not only should I have to be thoroughly convinced of its malignancy, but I should also wish to be thoroughly sure that the expectation of life in my patient would be increased by the radical operation; that he would live longer and in greater comfort after a partial gastrectomy than after a gastroenterostomy. Although I have no figures from my own cases to offer you at present, not having traced my patients since operation for malignant disease, I do know that the patients on whom I have done partial gastrectomy for carcinoma have lived on the average a longer time than those on whom I have been content to perform gastroenterostomy. Other surgeons have recorded better results from the radical operation than the palliative. As a result of my experience I personally believe that the mortality of gastroenterostomy is but little if any higher than pylorectomy or partial gastrectomy, if the operation is done with despatch and a perfect technique.

But to my mind gastroenterostomy is the treatment of choice for patients with advanced gastric carcinoma; nor do I limit it to cases in which pyloric obstruction is present. Even if marked stagnation of food does not exist, there can, I think, be no question that direct drainage of the stomach is beneficial, and that by diverting the chyme from its course over the ulcerating area we check to an appreciable degree not only the pain from the growth but the progress of the malady as well.

If the disease has not extensively involved the stomach, but yet is so far advanced as to contraindicate removal of the growth, I employ the usual operation of posterior gastroenterostomy. If, on the other hand, the disease has progressed further, so as to considerably debilitate the patient, or if there are extensive adhesions, especially to the pancreas, I do simply an anterior gastroenterostomy with the Murphy button. This is a simpler operation, consumes less time, and gives, I believe, equally good results for such patients, who can scarcely ever anticipate a return to normal diet and active life.

5. *Operation to Induce Euthanasia.*—Can surgery do anything rational to render less miserable the declining days of a patient who is slowly starving to death from an inoperable carcinoma of the stomach? In my own mind there is no manner of doubt that jejunostomy is frequently an imperative operation. It is true we do but substitute one form of death for another. But I think there are few patients and possibly fewer surgeons who would not prefer death to come from cachexia rather than from starvation. I believe that the profession in general does not appreciate the degree of alleviation of suffering which these procedures, gastrostomy and jejunostomy, afford. They are operations which may be done under local anesthesia if desirable; but, as a rule, so short a time is required for their performance that a few whiffs of ether will suffice, and will serve merely to stimulate, not to depress, the circulation.

In conclusion, I desire to say that the problems of the proper treatment of gastric diseases can only be worked out by the physician and surgeon

[3] Mikulicz and Kronlein-Moynihan: Abdominal Operations, Philadelphia, 1905, 223.

together. Many, very many cases of chronic gastric indigestion are really a form of surgical disease; and those which do not yield within a reasonable time to rational medical treatment can almost without exception be promptly and permanently cured by surgery. The fact above all others which I have tried to emphasize is that the surgeon is asking to be called earlier into consultation, that he may decide with the aid of his medical colleague not only which are proper cases for surgical treatment, but also at what period of the disease surgical remedies had best be applied. Both physician and surgeon are working conscientiously for the best welfare of their patients, and if the surgical side of the question has through this paper acquired greater merit in the minds of my medical confrères, its purpose will have been fulfilled.

HYPERESTHESIA OF THE GASTRIC MUCOUS MEMBRANE AND ITS TREATMENT.[1]

BY J. DUTTON STEELE, M.D., PHILADELPHIA, PA.

I wish to consider in this brief communication various questions connected with the symptom-group that is usually spoken of as functional hyperacidity. The use of the term functional excludes all structural changes in the gastric mucous membrane, such as ulcer and the lesions arising as the result of marked stagnation of the gastric contents. It also excludes diseases of the adjacent organs, which by local irritation produce excessive acid secretion, such as duodenal ulcer, gall-stones, and cholecystitis. I wish to show that the increase in hydrochloric acid secretion in cases of so-called hyperacidity is not the only factor in the production of symptoms, but that the pain is produced quite as much by gastric hyperesthesia as by an excess of acid.

Among 100 consecutive cases of gastric disease occurring in my private practice, seventy-nine may be fairly considered to be due to purely functional disorders without demonstrable structural change in the stomach. These figures suggest that a very large proportion of disorders of the stomach which a medical man sees in his private work are functional as compared with organic or structural lesions. In round numbers functional disturbances from reflex causes or local neurosis are responsible for three-fourths of the cases with gastric symptoms that we are called upon to treat in our private practice.

I have assumed that the normal limits of total acidity are from thirty to sixty, recognizing that these are arbitrary limits often overstepped in both directions in health. I have assumed that the total acidity fairly represents the hydrochloric acid secretion, provided it can be shown that there is not a decided amount of organic acid present. Emphasis must also be laid upon the fact that in tabulating the results of gastric analysis, we must deal in round numbers, since the best of our present methods are faulty and approximate only. Therefore, I may be pardoned if I assume sixty as the upper limit of normal gastric acidity. Of my seventy-nine cases, twenty-three showed a total acidity above sixty and can be placed in the class of hyperacidity. This is nearly one-third of the total number. Twenty-nine were between the normal limits of thirty and sixty; twenty-seven were below thirty. Lichty, of Pittsburg, in a recent paper (*American Medicine*, Oct. 28, 1905) states that in his experience of 225 consecutive patients (not necessarily exclusively functional) about one-third showed more than the normal amount of acid.

THE RESPONSIBILITY OF HYPERACIDITY FOR GASTRIC SYMPTOMS.

Of my twenty-three cases of hyperacidity, all but two suffered more or less sharp pain coming on about the height of digestion and relieved by food or alkali. This may be considered the most common characteristic symptom of the morbid condition known as hyperacidity. In two cases, increase of acid was discovered in the routine examination of patients without gastric symptoms. Of the twenty-nine cases within the normal limits, eleven

[1] Read before the Philadelphia County Medical Society, Nov. 22, 1905.

had this form of pain or discomfort, which is considered characteristic of hyperacidity. But a still more noteworthy fact is that three cases of total acidity under thirty quite constantly suffered from this form of pain, which came on some hours after eating and was relieved by food and alkali.

To summarize: (1) Many cases with a total acidity within the normal limits or below suffer with the form of pain that is usually considered to be due to an excess of acid. (2) A certain proportion of cases showing an amount of acid above the normal exhibit no gastric symptoms whatever.

This apparent departure from what our ideas of hyperacidity have led us to expect may be explained by two suppositions.

First, our methods of estimating gastric secretion are faulty. Our test breakfast, even our test meals, are not always sufficiently stimulating to the gastric mucous membrane to show what the stomach glands are accustomed to do under usual circumstances. However, almost all my cases were examined more than once and with different meals, and as I have said, I have not attempted to draw sharp distinctions, but have tabulated each case where the general average of examinations showed it to belong. Therefore, we can largely disregard this phase of the subject.

Second, it has long been recognized that some other element besides an excess of acid is required to produce gastric symptoms in hyperacidity. This second element is a sensory neurosis producing hyperesthesia of the gastric mucous membrane, which renders it intolerant of the increased free acid. If this hyperesthesia is not present, then hyperacidity will not produce gastric symptoms. This explains the two cases in my list and the cases referred to by von Noorden and Riegel, in which there was a total acidity much above the normal without gastric symptoms. If hyperesthesia is present and at the same time the acid is increased, then there will be pain at the height of digestion relieved by food and alkali. If the hyperesthesia is more intense, then even normal amounts of free acid will cause pain, and in the more severe grades of the sensory neurosis even a subnormal amount of acid will produce symptoms and discomfort. That is, if the hyperesthesia is severe enough we will have the symptoms usually associated in our mind with hyperacidity even though the acid secretion is below normal. The clinical lesson for us in this is that we must not be surprised or thrown off the track in such cases when with a clinical picture of hyperacidity we find normal or subnormal gastric secretion. For in these cases the hyperesthesia is the condition against which our treatment is particularly directed and the degree of the acid is a secondary consideration.

I have found that hypersecretion, both alimentary and continuous, is uncommon among the class of patients that makes up one's private practice. My list includes but three cases of hypersecretion. I need not speak of the laboratory findings in this condition. Its symptomatology in my experience is that of a very obstinate hyperesthesia and hyperacidity which do not yield to ordinary remedies and are often associated with severe paroxysms of pain and vomiting which are probably due to tonic spasm of the pylorus.

Treatment of Hyperesthesia.—It is needless to say that removal of the cause is the most important part of the treatment. In my series of thirty-five cases of hyperesthesia, fourteen were women and twenty-one men. The women were almost invariably of the neurotic type, and in most of them (eleven cases) the gastric symptoms seemed to be a manifestation of this condition. The men were chiefly brain workers: nine were students, three physicians, two lawyers and three clerks, or seventeen brain workers in a total of twenty-one cases.

The element of overwork seemed to play an important part in the production of the neurasthenic state; thus, of the total of thirty-five cases, eleven men and three women were distinctly overworked or under some nervous strain of responsibility or anxiety. Abuse of tobacco seemed to be responsible in four cases, of alcohol in one, and abuse of other narcotics (morphine) in one. Improper eating appeared to be the exciting cause in two cases only, and here the condition was probably a mild gastritis acida.

Breaking of the Vicious Circle.—In these cases there are usually certain morbid conditions which may be the direct result of the disturbance of gastric function or may be merely coincident with it, but which in either case have a deleterious effect

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upon the organism, and together with the primary affection form a vicious circle. To break this circle is often absolutely essential to the patient's improvement.

The first of these conditions is *malnutrition.* Although there is usually abundant gastric secretion the pain makes the patient very careful in his diet, and the result is that he is frequently overcautious. This must be kept in mind in the regulation of the dietary. The importance of proper nutrition in the treatment of the neurasthenia, which is a frequent exciting cause of the gastric symptoms, need not be emphasized.

The second of the associated conditions that must be watched for is *anemia.* A very moderate degree of secondary anemia of the chlorotic type was the usual blood change in my series. In none was there a true chlorosis. I believe that the condition of the blood is an important element in these cases, although the anemia is usually not of a severe type.

Constipation is the third important link in the vicious circle. A marked degree of constipation was present in fifteen of my twenty-one cases of hyperacidity. It is generally recognized that constipation plays some part in the symptom-complex of these cases of hyperesthesia and hyperacidity. Von Noorden goes so far as to claim that constipation is a direct cause of hyperacidity. I have always found that these cases are better when their bowels are moving freely, but have never been able to trace any direct causal relation between the two conditions. Perhaps the best laxative in the earlier and acute stages is the mixture of magnesia and rhubarb that is given to neutralize the acidity. However, regulation of the diet must be relied upon for permanent relief. High injections of olive oil have proven a very useful remedy in some of my cases, particularly when the constipation is very chronic.

Symptomatic Treatment—If hyperesthesia is present the gastric acidity must be neutralized as soon as the height of digestion is passed, without regard to whether the acid is increased, normal, or diminished. Naturally the amount of acid secreted regulates the quantity of alkali to be given, and in the cases of hyperesthesia with low acidity the sedative part of the treatment is more important than the alkaline. When the acidity is high alkalies must be given freely. The best mixture in my experience is magnesium carbonate and sodium bicarbonate in doses of twenty, ten, or five grains, according to the degree of acidity. Powdered rhubarb may be added in cases with constipation. The alkali should be given as a rule two hours after meals.

The Use of Sedatives.—I have always found that a general nervous sedative is one of the most essential parts of the treatment of hyperesthesia, especially in the earlier stages. Such are the bromides, valerianates, sumbul, and asafetida. In the cases of hyperesthesia with low acidity they constitute by far the most important part of the treatment, but their use should not be neglected in hyperacidity. After the acute symptoms are under control remedies directed toward the correction of the primary neurasthenia, such as iron, and especially nux vomica, may be substituted. Local sedatives to the gastric mucous membrane, as bismuth, silver nitrate, and belladonna and atropine, do much good in certain cases.

Diet.—When we recognize that the condition which we are called upon to treat in this class of cases is a sensory neurosis of the mucous membrane, we can understand that it is of the first importance that the food should be bland and non-irritating. Whether it is composed largely of proteids or not depends upon the amount of acid secretion, but non-irritating it must be. In the first stages then the diet should consist of milk and eggs in their various forms, purées of vegetables, scraped meat, and so on.

Later as the irritation subsides the dietary may be increased with due regard (1) to the state of the gastric secretions; and (2) to the degree of malnutrition present. I have not the space to enter upon a discussion concerning the various dietaries suited to individual cases, but wish to call attention especially to butter fat in the form of cream as one of the best foods for these cases. The value of fats in hyperacidity has long been recognized, and I find butter fat tolerated best of any. In such cases fats act both by inhibiting acid secretion and helping nutrition.

Treatment of the Paroxysms.—The attacks of pain that occur in the course of the severe grades of hyperesthesia and hyperacidity are best relieved

by prompt emptying and washing of the stomach by means of the tube. The pain may be combated by alkalies and sedatives, but neither compare in promptness or efficiency with thorough cleaning of the stomach by washing.

The type of paroxysm which occurs in the form of cramps and pain coming on during the evening and at night is best prevented by thorough lavage at 6 P M., followed by a non-irritating supper of eggs and milk. Occasionally, in aggravated cases, attacks of severe and almost continuous pain occur accompanied by uncontrollable vomiting of sour material. These paroxysms resemble the clinical picture of gastric ulcer except that no blood is present in the vomitus or stool. I have found that the best means of controlling these attacks is by rest in bed and rectal feeding until the urgent symptoms are relieved. Then milk should be given by the mouth and the diet gradually increased, as in an ulcer cure.

Although it is not always easy to prove, I am convinced that these more severe and obstinate cases of hyperacidity which are associated with pain and vomiting are cases of hypersecretion, and that the cramps and vomiting are due to tonic pyloric spasm, which is produced by an abnormally large amount of acid stomach contents.

Clinically, hypersecretion differs from hyperacidity with hyperesthesia chiefly in the intensity of the symptoms, its resistance to ordinary means of treatment, and the attacks of pyloric spasm accompanied by vomiting.

The etiology of the two conditions appears to be quite similar, and what has been said concerning the treatment of hyperacidity and hyperesthesia applies equally to hypersecretion.

The Electric Removal of Scars.—

The *Literary Digest* of May 12, 1906, contains a translation of an article in the Paris *Cosmos* on the removal of scars by galvano-faradization. The method is attributed to Dr. Lewandowski, an Austrian military surgeon. It is stated that he has treated about thirty cases of severe scarring, and the results have been in every way satisfactory. The scars have softened, the discolorations have disappeared, the surface taking on more nearly the appearance of normal skin. The application is made with two large electrodes moistened with a 10-per-cent salt solution. The negative electrode which is applied to the sacrum has an area of 30 square inches. This is connected with the positive pole of a galvanic battery. The negative pole of the battery is connected with the positive pole of the induction coil, and this electrode has a surface of about 16 square inches. The apparatus has a commutator that enables the operator to use either the galvanic or faradic current alone or the two combined. The strength of the constant current employed is from 3 to 4 milliamperes. The induction current should be sufficiently intense to provoke appreciable contraction of the muscles. Each treatment should last from fifteen to thirty minutes.

Treatment of Serous Iritis and Intestinal Keratitis by Acetozone.—

Charles Wray (*General Practitioner*, May 12, 1906) says that the treatment of these conditions has so far proven unsatisfactory. Mercury, which has been so much in vogue, is of very little use. For some years the writer has been observing the condition of the intestinal tract in cases of ulceration of the cornea in children. He has almost universally found that the bowel movements were fetid. To correct this he prescribed resorcin, but this is often followed by disturbance of the kidney. These untoward effects of resorcin led him to try acetozone, which he used in capsules containing three grains, giving from four to five each day. The acetozone should be given with a large quantity of water, at least half a pint before the capsule and as much after it. The patient should then walk briskly for about a quarter of an hour. The results of acetozone treatment have been quite satisfactory. In some cases salmon-colored corneas have been cleared in two or three weeks.

BOOK REVIEWS.

BIENNIAL REPORT OF THE DEPARTMENT OF HEALTH OF THE CITY OF CHICAGO FOR THE YEARS 1904–1905.

Departmental reports have in the past been of comparatively little value, but of late years the scientific work accomplished in various governmental laboratories as well as the recognition that such reports should have a value apart from the mere account of work done has led to their containing a vast amount of material which is of practical value. This is especially true of the report of the Department of Health of Chicago, containing as it does reports of the director of the laboratories, and the various bureau chiefs. It contains an amount of material treated in a practical way that will make it of value to every health officer.

The phenomenally low death-rate of Chicago has attracted attention throughout the country, and has led to some criticism of the statistics. Recently the matter was gone over by a committee of the Chicago Medical Society, and they found no error in the methods employed in gathering the data nor in their comparison. During 1905 there were 27,212 deaths reported, which on an estimate of population a little short of two million gives 13.67 per thousand, a very little higher than the death-rate of 1904. Compared with ten principal cities of the country, those having populations of 350,000 or upward, the death-rate is nearly one-fifth lower. Of this group of cities Buffalo has the lowest death-rate (14.14), only a trifle higher than that of Chicago, while Pittsburg heads the list with a death-rate of 19.60. Compared with its own record Chicago's public health is seen to be steadily improving with each successive decade. In 1904 Chicago had a rather serious outbreak of smallpox, but the vaccination crusade has practically eliminated this disease. The number of deaths from typhoid fever (329) was less than any year since 1880. The mortality-rate from diphtheria, which in the decade ending 1894 averaged 9.9 per 10,000, in the following decade had fallen to 4.8. In the last nine years of this period nervous diseases show a marked decrease, and also there is a falling off in the number of deaths from pneumonia. The three diseases affecting adult life which show an increase are Bright's disease, cancer, and heart disease.

The value of milk inspection is fully attested by the increase in water in the samples of October and November, 1905, when the Health Department laboratory was temporarily crippled by removing it to new quarters. The estimated cost to consumers of the increased amount of water in the milk is close to $100,000, nearly one-half of the cost of running the Health Department. As yet the Department is unable to establish a bacteriological standard for milk, but there has been an immense improvement effected by inspecting dairies, studying the manner in which milk is handled, and compelling the use of clean, bright milk cans for the transportation of this fluid.

The report contains a number of papers, notably one by J. F. Biehn on "The Results of the Examination of Throat Cultures for Diphtheria," and another one by the same writer on "The Use of Chloroform in the Preparation of Vaccine Lymph." There is a preliminary report by Ross C. Whitman on "A Rapid and Simple Method for Bacteriologic Examination of Drinking-water."

The report contains the usual mortality tables, and taken all in all is a mine of information for the public health official.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. By Prof. Dr. Carl von Noorden. Part V: Concerning the Effects of Saline Waters (Kissingen, Homburg) on Metabolism, by Prof. Carl von Noorden, Frankfort, and Dr. Carl Dapper, Bad Kissingen. Translated under the direction of Boardman Reed, M.D. New York: E. B. Treat & Co., 1905. Price 75 cents.

The short monographs of von Noorden furnish about the only recent contribution that can be styled original to the general subject of disorders of metabolism and nutrition. Collectively they include some of the most important chronic ailments, such as obesity, nephritis, colitis, the acid autointoxications, diabetes, etc. In this discussion of saline therapy, which is based on investigations carried out by Dr. Dapper between the years 1894-6 and subsequently, the studies were continued by Dr. Dapper at Kissingen and by von Noorden at the Municipal Hospital at Frankfort. The latter investigations corroborated and amplified the original studies. Like most of the studies of von Noorden, the work has been carried out on sick people, in this respect differing from much that is published on metabolism and nutrition where the data is frequently supplied by healthy men or animals. Too much *a priori* reasoning has been indulged in based on such experimental work. The great value of von Noorden's studies is that they are essentially clinical and are carefully made with reference to establishing a rational basis for a given therapy.

We shall not enter into an extended discussion of the data and reasoning of the author, but merely state his conclusions, which are so at variance with the commonly accepted action of saline waters that it should lead those who are interested in the subject to a careful study of their basis. He says that in gastric disorders, particularly

in gastric catarrh, the use of saline mineral waters leads to an active and permanent increase in the production of hydrochloric acid. In hyperacidity, particularly in nervous dyspepsia, the moderate use of saline mineral waters leads to a decrease of the hydrochloric acid production and a lessening of the subjective symptoms. The administration of saline mineral water does not call for any particular diet. To adhere to such dietetic schemes as are arranged in the different watering-places is an antiquated procedure which may be deleterious. There is no reason why large quantities of fat should not be given in suitable cases to patients who are drinking certain mineral water, nor should the use of raw foods, vinegar, and salads be restricted in special cases. The ingestion of large quantities of saline mineral water does not interfere with the absorption of food, particularly fats, and the metabolism of proteids is not increased by saline mineral waters. The excretion of uric acid when dilute saline mineral waters are taken is sufficient to justify the use of these waters where there is uric acid retention.

TEXT-BOOK ON PRESCRIPTION WRITING AND PHARMACY. By Bernard Fantus, M.D. Second Edition. Chicago Medical Book Company, 1906. Price $3.00.

ESSENTIALS OF PRESCRIPTION WRITING. By Bernard Fantus, M.D. Chicago Medical Book Company, 1906. Price $1.00.

The first of these volumes represents the second edition of the laboratory manual on Pharmacognosy, Pharmacy, and Prescription Writing which was published in 1902. The first part of the work is devoted to prescription writing, the second part to pharmacy, and the third part is made up of a condensed list of the materia medica, giving the Latin name, a brief description, the solubility, composition, incompatibility, uses, and average dose, with the most popular form of administering the remedies of the materia medica. In this work the needs of the medical student have been kept in mind, and it has been distinctly the aim of the writer to meet the needs of the medical student and not to attempt to make him an expert pharmacist. In the second part of the work the author is not content with inculcating the rules of prescription writing, but by numerous examples a faithful attempt is made to fix the precept by practice. Progress in the lessons is obtained by first teaching the student how prescriptions can best be prepared, then he is exercised in the putting together of different drugs, and finally asked to prepare prescriptions for certain diseases. As the author points out, the present state of medical teaching in reference to the materia medica and prescription writing is deplorably deficient, and this furnishes a fruitful field for the ready-made prescription, than which nothing could be more detrimental to the progress of therapeutics.

The Essentials of Prescription Writing is a small book of 136 pages, which covers the same field as Part I of the larger volume.

INFECTION, IMMUNITY, AND SERUM THERAPY IN RELATION TO THE INFECTIOUS DISEASES WHICH ATTACK MAN. With Considerations of the Allied Subjects of Agglutination, Precipitation, Hemolysis, etc. By H. T. Ricketts, M.D., Instructor in Pathology, University of Chicago. Chicago: American Medical Association Press, 1906.

This volume is made up of a series of papers that appeared during the year 1905 in the *Journal of the American Medical Association*, and has been published in response to an expressed desire to have them gathered together in a convenient form. In the main the general plan corresponds to that of Sternberg on Immunity and Serum Therapy, and the book contains much that can be found in W. C. Bosanquet's "Serums, Vaccines, and Toxins in Treatment and Diagnosis" and in Waldheim's "Serum-Præparate." It is, however, more extensive and much more up-to-date than any of these works, having been written within the last year or so.

Unfortunately, as is not infrequently the case in synoptical writings of this kind, the literary references have been omitted. Thus the work stands by itself, and although the facts are given it does not introduce the reader who desires to broaden his information to those sources from which the subject-matter has been gleaned. The author's plea that "to one who is conscious of the massive proportions of the literature this needs no explanation" scarcely seems a justifiable excuse. The important references should have been displayed.

Every general practitioner of medicine should read this work. Most of them probably did so, as it appeared in the *Journal*, but any who did not will undoubtedly derive great profit as well as pleasure from a perusal of the volume in which the continuity of the subject is not broken.

PATHOLOGY, GENERAL AND SPECIAL, FOR STUDENTS OF MEDICINE. By R. Tanner Hewlett, M.D., M.R.C.P., D.P.H. Philadelphia: P. Blakiston's Son & Co., 1906. Price $3 25.

The first impression that one receives from a cursory glance at this book is that its small size suggests it to be a kind of synopsis—a sort of book that it has always been our policy to denounce in no uncertain terms—and the perusal of the preface confirms the impression when we read that the author has "endeavored, in this book, to detail the essentials of general and special pathology, such as seem to be required by the majority of medical students." The statement that "No novelty is claimed in the arrangement of the subjects or presentation of the matter" is regrettable, as it places the book upon a par with the many works upon the subject already in existence, and of course immediately raises the question why the book should exist at all; and, indeed, the answer is not forthcoming. The subjects are those ordinarily treated in books on pathology, the classification of the

matter is conventional, the amount of space devoted to each subject limited, and while the essentials are undoubtedly given and the newest opinions and theories generally entertained, it seems remarkable that so good a writer as Professor Hewlett should have occupied himself with the production of a book which must struggle in competition with the excellent books of Lazarus-Barlow and Sidney Martin in the author's own country, and the many excellent ones in our own.

LECTURES UPON PRINCIPLES OF SURGERY. By Charles B. Nancrede, A.M., M.D., LL.D. With an Appendix Containing a Résumé of the Principal Views Held Concerning Inflammation, by William A. Spitzley, A.B., M.D. Second Edition. Philadelphia and London: W. B. Saunders & Co., 1905.

The author, who is Professor of Surgery and Clinical Surgery in the University of Michigan, presents in this second edition of his work the principles of surgery. He has done so in an admirable manner, not attempting to cover the entire domain of bacteriology and pathology, but to present these subjects from a surgical standpoint. It is obvious that in treating the principles of surgery an author may present too much, or on the other hand may err in condensing to too great an extent. This work occupies a middle ground and presents the principles of surgery in a readable and succinct manner. The volume is in the form of lectures as delivered at the University of Michigan. The excellent résumé of the views concerning inflammation by Spitzley gives the historical development of that subject.

THE TREATMENT OF FRACTURES. With Notes upon a Few Common Dislocations. By Charles Locke Scudder, M.D. Philadelphia and London: W. B. Saunders & Co., 1905.

The earlier editions of Scudder's work on fractures have been so thoroughly reviewed in these pages that extended comment on this volume is not necessary. The first edition appeared in 1900 and at once achieved a marked popularity, so that within a year it was necessary to revise it. The subsequent editions have kept the work fully abreast of the advances made in this department, which have been by no means inconsiderable. The more extended use of anesthetics and of the x-ray in the diagnosis of fractures as well as the open method of treating these conditions has resulted in greater precision in their diagnosis. This of necessity has altered much of the old teaching regarding fractures and the commoner dislocations. The work contains 736 illustrations, all of which are useful and practical. The most of them are original. In discussing the ambulatory treatment of fractures the writer says that its strict application is not wholly surgical, as it does not perfectly immobilize the fractured parts. At the same time a prolonged stay in bed to obtain perfect immobilization has its disadvantages. There should be a careful and earlier use of plaster-of-Paris splint, together with the use of crutches and a high sole on the well foot.

THE PATHOLOGY AND DIFFERENTIAL DIAGNOSIS OF INFECTIOUS DISEASES OF ANIMALS. By Veranus Alva Moore, B.S., M.D. With an Introduction by Daniel Elmer Salmon, D.V.M. Second Edition, Revised and Enlarged. Illustrated. Ithaca: Taylor & Carpenter, 1906. Price $4.00.

Professor Moore is to be congratulated on the success of the first edition of his work and upon the satisfactory way in which his new edition brings the subject-matter up to date. Though undoubtedly intended for the veterinary surgeon, much that the book contains will be found of interest to the medical practitioner. Indeed, at the present time, when the study of the diseases of animals is continually opening the way for the discovery of the etiology of the diseases of human beings, a certain familiarity with the former is essential to the medical practitioner, and the five hundred pages contained in Dr. Moore's book will be found extremely valuable from this point of view. To the veterinarian the book is, of course, indispensable, and to those not familiar with the German language it is undoubtedly one of the best books. The subject-matter upon the trypanosomes and upon rabies is particularly good and up-to-date.

THE PRACTICE OF GYNECOLOGY. In Original Contributions by American Authors. Edited by J. Wesley Bovée, M.D. Lea Brothers & Co., Philadelphia and New York, 1906. Price $7.00.

This magnificent work of 836 pages on gynecology deserves a far more extended notice than we are able to give it. It is splendidly illustrated, containing 382 engravings and 60 full-page plates. It is the first of a series of three companion volumes dealing respectively with gynecology, obstetrics, and pediatrics. The contributors to the present volume include Bovée, Goffe, Miller, Noble, Schenck, Watkins, and Werder. The seven contributors have written in all thirty chapters covering the entire field of gynecology. The preparation of the volume by a comparatively limited number of writers has enabled them to cover the ground better than if a larger number had contributed, as in this way there is less repetition and fewer omissions, factors which seriously interfere with the symmetry of a work prepared by a number of writers.

We take great pleasure in commending the work, which is a splendid example of the publishers' art. The illustrations are superb. With its companion volumes it will form the most imposing American series in this department of medicine.

ABSTRACTS.

THERAPEUTICS.

The Home Sanatorium Treatment of Consumption.—

PRATT, J. H. *Bulletin of the Johns Hopkins Hospital*, vol. xvii, No. 182, p. 140, May, 1906.

The attempt to cure pulmonary tuberculosis among the poor is a difficult problem, and has until recently been regarded by the profession as quite hopeless. Flick has obtained admirable results in the slums of a great city. The essential feature of the sanatorium treatment is careful regulation of the details of daily life, and the essential feature of the climatic treatment is life in the open air. The success achieved by C. L. Minor, of Asheville, in the treatment of patients outside of a sanatorium led the writer to attempt the same plan in a crowded city. That the home and dispensary treatment have proven unsatisfactory is due to a lack of careful supervision and a failure of discipline. The tuberculosis dispensaries have been useful in preventing the spread of the disease and in educating the general public, but relatively few cases treated by dispensary methods have been cured. The tuberculosis dispensary gives a relatively small amount of care to a large number of patients, while the "home sanatorium" gives a large amount of care to a small number of patients. The writer aptly says that this method bears the same relation to a sanatorium treatment that a correspondence course does to a college course. Every detail of the daily life is supervised and strict discipline maintained. A nurse is employed to visit the members of the class. She is termed a friendly visitor, which more exactly defines the nature of her duties. She should be the family's wise counselor, kindly and tactful, yet a good disciplinarian. The class should number but a few members, the limit not exceeding 25. No patients were refused because they were too far advanced—in fact, only two might be spoken of as incipient cases. All the patients were poor. None of them could afford the $4 a week charged at the State sanatorium. Not all the members were intelligent, and several were unusually stupid.

Before admission to the class is granted the applicant must promise to give up all work, to live the out-of-door life, and to obey the rules of the class. After the decision to join the class has been made a clinical history is taken and a complete physical examination made. Once a month the lungs and sputum are reëxamined. The nurse is sent to discuss the question with the invalid and the family, and to determine whether it will be possible to carry out the open-air treatment in their home. If there be no roof, balcony, piazza, or yard available for the rest treatment in the open air, the family must move to a tenement that will enable the tuberculous invalid to spend the entire day and night out-of-doors. At the first visit the nurse examines the house and locality, obtains the social history of the case, ascertains the exact financial condition, and gives what instruction may be necessary to prevent the spread of the disease. A detailed report of this is given to the physician in charge. Usually the patient is visited daily or at short intervals until the details of the treatment are understood and followed.

Of the class of 15 members, in January all were sleeping out-of-doors excepting one, who was not allowed by his landlord to put a tent on the roof. He was sleeping with his head out of the window. The patients are given milk, bread, fruit, butter, and oil. For the first few weeks no exercise is allowed, and later only when the temperature is normal the entire day. The exercise is at first limited to five minutes, which is later increased if the patient does well and there is no rise in temperature. In carrying out a strict supervision an important aid is the individual record book, which tabulates the food, exercise, pulse, temperature, and the facts regarding the out-of-door life. A weekly meeting of the class is held at the Massachusetts General Hospital. This work, including the salary of the free visitor, has been provided by charity, and the total cost has been only $513.

Of nine patients who have been members of the class for three months or more, all but two show improvement in their general condition. In five of the nine cases the disease has been arrested.

Treatment of Chronic Diseases of the Heart by the Nauheim Methods.—

KINNICUTT, F. P. *Boston Medical and Surgical Journal*, vol. clxxiv, No. 20, p. 539, May 17, 1906.

The Nauheim baths were first employed for the treatment of rheumatism in the early part of the last century. The improvement often associated with the organic diseases of the heart led Beneke as early as 1860 to recommend these baths in cardiac disease. The springs, which are three in number, contain chloride of sodium, chloride of calcium, and carbonic acid gas, both free and in combination. A system has been elaborated which permits of a wide variation in the saline and carbon dioxide strength of the baths, and as they vary in their different constituents they are known as: (1) The ordinary brine bath (gewöhnliches Soolbad), free from carbonic acid, but rich in salines. (2) The thermal brine bath (Thermalbad), rich in salines and coutaining a considerable amount of carbonic acid in combination. (3) The thermal effervescent bath (Thermal-Sprudel), holding an intermediate position between the thermal and the bath next to be described. (4) The effervescent bath (Sprudelbad), which receives its waters direct from the subterranean springs, with the full saline and carbonic acid content and with only a very slight diminution in their natural temperature. (5) The current thermal brine bath and current effervescent bath (Strombad and Sprudelstrombad). These baths also receive the water as it leaves the springs. The water forcibly enters at the lowest level of the bath-tub, and by means of overflow pipes at the top leaves it throughout the entire period of immersion. The saline strength of the various baths can be increased at will by the addition of the crystallizable waste product, mother-lye (Mutterlauge), of the neighboring salt works.

The course of baths usually begins with brine, strengthened after a few immersions by the addition of gradually increasing quantities of mother lye. Then follows the thermobrine bath and later the effervescing Sprudel baths. The effervescing current baths are reserved for the final days of treatment and often are not given. The duration of these baths at the beginning of treatment is not longer than six to ten minutes, gradually lengthened to twenty minutes. The latter time is rarely exceeded. The temperature of the first baths is generally from 92° to 95° F., which is gradually reduced, but temperatures as low as 83° are rarely used. Usually not more than two or three successive baths are permitted in as many days, when an interval is prescribed. The patient on emerging from the bath is wrapped in heated towels and quickly dried by the attendant. Rest for an hour in the recumbent position is imposed after the bath. In healthy subjects the immediate effect of immersion in the bath is a notable diminution in the frequency of the pulse and a distinct increase in its volume. Usually there is also a slight increase in the depth of the respirations, with a corresponding decrease in their number, and a vasodilatation of the superficial vessels, as indicated by the uniform reddening of the surface of the body. This is especially marked in the effervescing Sprudel bath. The pulse falls from eight to ten beats after immersion. This initial fall is followed after ten or twenty minutes by an increase in the pulse-rate. The evidences of vasodilatation of the surface are well marked, and with it there is a sensation of coldness.

The graduated exercises known as the Schott resistance exercises consist of slowly conducted flexion, extension, adduction, abduction, and rotation, in orderly succession, of the arms, trunk, and lower extremities. Each succeeding movement is resisted by an attendant with such force as to oppose without arresting it. Each movement must be slowly and evenly made with a definite and uniform effort on the part of the patient. The office of the attendant is not limited to resisting the movements, but it is his duty to impose a short interval of rest after each movement, to enjoin slow and regular breathing, and more especially to prevent any undue strain such as would be shown by hurried respiration. The attendant must bear upon but not grasp or constrict the limbs. The degree of resistance and number of movements should be modified or discontinued according as they affect the pulse and respiration. The duration of the single treatment is as a rule fifteen to thirty minutes, including the

intervals of rest. In gentle exercise the pulse is lessened three or four beats and there is a rise of blood-pressure. Later the latter falls to normal and the pulse is frequently unaltered. The effects of the baths and the Schott exercises are a shrinkage in the area of cardiac dulness and a slight upward movement of the apex. An exact radiographic study shows that this means a lessening of the volume of the heart. The duration of this diminution in size is very short, but the continued employment of the method produces permanent results. The best results are obtained in cases of enfeebled, relaxed, dilated hearts, with or without a murmur, following prolonged and exhausting diseases. It is also useful in cardiac inadequacy which follows severe muscular effort. In incurable organic disease the best results are obtained in mitral insufficiency with dilatation. Where the compensation is maintained with difficulty and in the early stages of failure very striking results are secured.

The Nauheim treatment is sometimes useful in cases of angina pectoris. In those in which the disease is due to organic coronary disease the prospects are not so good. Cases with a high vascular pressure, those above 170, should not be subjected to this treatment. In administering the treatment little exertion and no fatigue should be the watchword. Much depends upon a careful selection and instruction of the operator. There is a tendency on the part of the patient to hold the breath and keep the body rigid, which involves greater conscious effort. This must be avoided. The operator should be trained in the observation of ordinary symptoms. The use of too great resistance is the most common fault of the operator and the most difficult to correct. The resistant exercises alone are often useful in cardiac inadequacy.

Treatment of Basedow's Disease.—

KOCHER. *British Medical Journal*, No. 2370, p. 1261, June 2, 1906.

Professor Kocher in an article entitled "A Contribution to the Pathology of the Thyroid Gland," in which he especially discusses the surgical treatment, divides all goitres into the vascular, colloid, and Basedow types. He leans strongly to the theory that the symptom-complex of Graves's disease is attributable to a hyperthyreosis. Operations on the thyroid in Graves's disease show a diminution in the abnormal function in proportion to the amount of gland taken away. If one artery is ligated there is a slight amelioration of the symptoms; if two the effect is much greater. If one lobe of the gland is removed there is still more marked effect on the symptoms. The best results are afforded by removing one-half of the gland and ligating the superior thyroid artery on the side which is allowed to remain. The results of operation are such that he thinks it should be recommended to every patient affected with Basedow's disease regardless of the stage to which the disease has advanced. The operation should not be delayed too long, otherwise there is danger of a fatal termination. In his last 1000 cases of excision for ordinary goitre he only lost three patients, while there were nine deaths in 175 operations for Basedow's disease. The following table shows the results in 176 operated cases:

TABLE OF CASES OF THYREOTOXIC (GRAVES-BASEDOW'S) DISEASE.

Total number of cases seen 225
Total number of cases operated upon..... 176

	Operated upon.	Mortality of operation.	No further news.	Amelioration.	Great amelioration.	Cured.
1. Struma vasculosa, commencing Basedow's disease; symptoms mainly local.	10	0	0	0	0	10
2. Struma basedowificata, milder form developed on a preëxisting ordinary goitre	60	0	0	0	2	49
3. Struma basedowiana; typical Basedow's disease.	106	9	9	17*	0	62

Total mortality..... 5 per cent
Immediate recovery. ..... 95 per cent.
No later news. ..... 10 per cent.

Of the remaining 158 cases:
Died later ..... 2 per cent.
Improved. ..... 10 per cent.
Greatly improved..... 7 per cent.
Cured..... 81 per cent.

In all severe cases of Basedow's disease there is a greater reaction after operation than after excision of ordinary or even malignant goitre. There is a sudden rise of temperature and increase in the heart's action. If the heart has already been weakened by degenerative changes it may suddenly fail, and death follow very rapidly, some-

*In one of these only preliminary operations have been performed up to the present time.

times unexpectedly. This increase in the nervous symptoms in Basedow's disease follows operations probably due to increased resorption of thyroid secretion due to manipulation. Emphasis is laid on the fact that operation in the early stages of Basedow's disease is comparatively safe. He has not lost one case in which the operation was performed early even in bad cases, but such patients have been carefully treated medically for months before the operation. Such treatment consists in a judicious use of very small doses of iodine for a short time, the continuous use of phosphates, and mental and bodily rest. He often begins the operation with a ligature of one superior artery, ligating a second artery ten days or a fortnight later when the patient shows improvement. Excision of one-half the goitre is only done after some weeks when the symptoms of disease show a decided diminution.

Treatment of Branchial Fistula with the Electric Current.—

CHEVERS, M. J. *British Medical Journal*, No. 2365, p. 974, April 28, 1906.

The patient, 22 years of age, had a branchial fistula which extended from the sternomastoid muscle to the clavicle and upward to the border of the hyoid bone. There was no tumor connected with the fistula, and it had at least one communication with the pharynx, as substances injected into the fistula could be recognized by the taste. The fistula was first syringed with 1-in-40 phenol solution, and then a silkworm drain saturated with croton oil was passed to the bottom of the fistula. This set up a copious discharge. The canal was syringed with antiseptic solutions, and two days later a silver-wire electrode was passed into the fistula. The current was gradually increased from zero to 5 m. a. At first the silver wire was made the cathode, and later it was changed to the anode and the current gradually increased to 10 m. a., after which a superficial dressing without drainage was applied. The next day and every day for a week the constant current was applied to the skin surface immediately over the fistula, the active electrode being at first the cathode, with a current of from 15 to 20 m. a. The active electrode was later made the anode and the current increased to 30 or 35 m. a. An alternating current was used for these surface applications, and at the end of a week there was no discharge from the external fistula. At the end of the second week's treatment there was still an occasional bitter discharge into the mouth. During the past year there has been no return of the discharge and the fistula has closed.

Pleuritic Effusion Treated with Adrenalin.—

EWART, W., and MURRAY, F. *British Medical Journal*, No. 2365, p. 973, April 28, 1906.

The patient, aged 10½ years, was admitted to the hospital on the eighth day of his illness. He was dyspneic, slightly cyanosed, and the temperature was 102°, with the respirations 48. There was considerable cardiac displacement, and the ventricular beat could be felt in the second right intercostal space and nipple line. At the left apex the resonance was diminished and some crepitations were heard. The whole of the rest of the left chest wall was dull, with absence of breath sounds. Paracentesis was performed, using an ordinary trocar and cannula and introducing it at the seventh interspace in the anterior axillary line. A second trocar and cannula was introduced at the third interspace, through which aseptic air was allowed to enter. Somewhat less air was admitted than the fluid withdrawn. The breathing was improved; the temperature continued to fall after the aspiration. It was, however, soon evident that the fluid was reaccumulating. Ten days after the aspiration, as the fluid in the chest continued to rise there was introduced into the chest an intraserous injection of ten minims of adrenalin. Within the next eleven days four additional injections were given. These were followed by a prompt disappearance of the fluid, the heart returned to its position on the left side, the air in the pleural cavity was absorbed, the patient rapidly gained in weight and made a prompt recovery.

In using adrenalin in this way it is important that the syringe through which the injection is made should be introduced into the pleural cavity, and that the injection should be made into the accumulated fluid and not into the rapidly absorbing tissue of the lung. If the needle is introduced through the chest wall and some of the fluid allowed to flow through the needle, this gives the assurance that the adrenalin will be injected into

the effusion. The writer's experience in this case would seem to justify the belief that repeated injections of adrenalin may make the operation of paracentesis unnecessary. It may be employed as a preliminary to paracentesis, and when used in this way may prevent the secondary accumulation of fluid.

Dionin in Ophthalmic Practice.—

HINSHELWOOD, J. *British Medical Journal*, No. 2367, p. 1098, May 12, 1906.

During the past two years the writer has used dionin extensively in ophthalmic practice and has been impressed with its value as an analgesic. He used it chiefly in a 5-per-cent solution in water, or made up with vaselin as an ointment of similar strength. When instilled into the conjunctival sac it does not alter the sensitiveness of the cornea to touch, and hence is of no use for the removal of foreign bodies or for operations upon the eye. It is especially useful in inflammatory processes, such as iritis, cyclitis, glaucoma, and inflammation of the cornea. Dionin does not dilate the pupil nor does it increase the tension of the eye, and hence is free from the dangers which accompany the use of cocaine. It is superior as an analgesic even to holocaine, and is the most useful drug in relieving deep-seated pain. The patient should be warned that the instillation of dionin is frequently followed by some burning and irritation, and not infrequently swelling of the conjunctiva. The latter need cause no anxiety as it rapidly subsides. Dionin has a marked local effect upon the cornea, clearing up opacities and infiltrations. In this respect it shows the greatest power over recent infiltrations, but those of longer standing often show marked improvement. In treating inflammation of the cornea it is well to combine the atropine with one or two per cent of dionin. This answers the double purpose of relieving pain and hastening the absorption of the corneal infiltration. When using the dionin for the relief of opacities it is best to use it in the form of an ointment, beginning with one that is weak, about 4 grains to the ounce, and gradually increasing the strength up to 12 grains to the ounce. A little of the ointment is inserted under the lids, and the cornea is gently massaged through the closed lids, first once and subsequently twice daily.

The Local Action of Stovaine.—

MCKENZIE, D. *British Medical Journal*, No. 2367, p. 1099, May 12, 1906.

During the past three months the writer has used stovaine in nose and throat operations. He employed it in solutions, the strength varying from 5 to 20 per cent. The 10 per cent was found to be strong enough for most cases. The applications were made on tampons of cotton-wool soaked in the solution and squeezed fairly dry. In using it in the nose the tampons were inserted in the nostril so as to lie in contact with the mucous membrane of the part to be operated upon. In throat cases a swab wrapped with cotton-wool was employed. In ear cases a small plug of wool moistened was inserted into the external auditory meatus. The writer has used it in 57 cases, the majority of which were intranasal operations, and in comparing the anesthetic action of stovaine with cocaine he believes that the former is quite as powerful as the latter. In not a single case was there any complaint or indication of toxic phenomena. In one case in which a septal spur was removed by sawing under nitrous oxide and ether, and in which a tampon charged with stovaine and adrenalin solution had been placed in the nose, the operation lasted longer than had been expected, and the patient recovered from the anesthetic before the sawing was finished, but experienced no pain. In a number of cases it was noted when the application exceeded twenty minutes in duration slight ulceration was produced, which however readily healed.

The Treatment of Arthritis Deformans with the Roentgen Rays.—

ANDERS, J. M.; DALAND, J.; and PFAHLER, G. F. *Journal of the American Medical Association*, vol. xlvi, No. 20, p. 1512, May 19, 1906.

The writers make a preliminary report on the treatment of arthritis deformans with the Roentgen rays, describing two cases. The first dates from July, 1902, when there was tenderness of the feet. The toes became swollen. A year later there was a remission, but later the patient was incapacitated by the advancing disease. Four months before admission his left wrist became swollen, and later the left elbow and shoulder had restricted movements. At the time of admission the left

arm could not be raised from the side. To study the local effects of the treatment only the joints of the wrist, elbow, and shoulder of the left side were selected for treatment. Treatments were given with a medium tube at a distance of 15 inches. Each treatment lasted for about fifteen minutes. Treatment was begun early in November, 1905, and after the first application there was less stiffness and less pain. After sixteen treatments the joints of the left upper extremity were practically well. Massage to all the joints was given, and also sodium iodide internally. The joints of the lower extremities were not treated by the *x*-ray, and showed no improvement as a result of the constitutional treatment and the massage.

Another case was one in which both knees as well as other joints were involved. The left knee, which was the most troublesome, was alone treated. In this knee there was an enlargement and an exudate into the periarticular tissues with elevation of the patella by fluid. The treatment was applied as in the first case, and at the end of five weeks the patient was able to walk out of the hospital. At the time he was admitted he was bedridden.

The results obtained in the two cases confirm the observations of Moser, who has treated gout and rheumatism with the Roentgen rays, and in all the cases improvement was noted. This method of treatment is valuable in chronic joint inflammations, and it should be associated with massage and passive motion. The rays stimulate and increase the metabolism within the joint, and the massage and passive movements assist in the removal of exudate.

The Dietetic Treatment of the Vomiting of Pregnancy.—

KOLIPINSKI, L. *New York Medical Journal*, vol. lxxxiii, No. 23, p. 1173, June 9, 1906.

The pernicious vomiting of pregnancy is distinguished from the simple vomiting by its severity, the epigastric and presternal pain, acute thirst, rapid debility, and marked emaciation. These symptoms commonly pass into a second stage in which there is a low fever and a high pulse-rate. In the final stage of these cases the vomiting ceases and the patient passes into a typhoid state, but with increasing fever, delirium, and syncope. The disease commonly extends over two or three months. The estimated mortality of these cases untreated is 57 per cent; with treatment 39 per cent die. These cases must be distinguished from acute yellow atrophy of the liver, gastric ulcer and cancer, nephritis, acute tuberculosis, and cerebral tumor. The vomiting of pregnancy should be regarded as pernicious when wasting of the body and weakness have become sufficiently great to prevent the patient from leaving the bed. The ordinary treatment of the vomiting of pregnancy is of no use in these acute cases, as everything which excites the reflex act causes the stomach to discharge its contents. This paresthesia of the organ is not due to organic disease, as the stomach could perform its functions if it were not for the state of unrest and excitability. The dietetic treatment of pernicious vomiting is generally summed up by the recommendation to use a mild liquid diet or other easily digested foods. This is all wrong, as a solid diet should be given, and the writer regards the best food as pork, ham, or bacon. A breakfast composed of these foods is frequently followed by prompt digestion, and their continued use, associated with other solids, such as beefsteak, roast or corned beef, with vegetables, is often followed by a marked improvement in the nausea. The foods which commonly induce vomiting are water taken freely, milk, tea, coffee, soups, eggs, toast, and fruit.

Intraspinal Injections of Magnesium Sulphate in Tetanus.—

LOGAN, S. *Journal of the American Medical Association*, vol. xlvi, No. 20, p. 1506, May 19, 1906.

The writer reports two cases treated by Meltzer's method, the latter writer having reported a cure of a case at the Roosevelt Hospital by the injection into the spinal canal of a 25-per-cent solution of magnesium sulphate in the proportion of 1 Cc. to each 25 pounds of body weight. The two cases reported were both fatal, but the treatment showed a marked effect in controlling the spasms. This was by far the most interesting feature. In the first case at the time of the injection there was rapid contraction of the abdominal muscles, which under full anesthesia did not materially

lessen. Forty minutes after the injection there was complete relaxation of the spasm and of all muscles of the body. The patient was so relaxed that he could open the mouth wide and could swallow, was conscious, and talked freely to the attendants. The period of relaxation lasted for thirteen hours, during which time the patient distinctly improved. Had the second injection been given earlier there might possibly have been a better result, as the period of rest would have been lengthened. Case two was of the fulminating type, in which the injection failed to control the convulsions. It is probable that the dose of magnesium sulphate was too small.

Exercise as a Remedy.—

WAINWRIGHT, J. W. *Medical Record*, vol. lxix, No. 18, p. 706, May 5, 1906.

Moderate exercise is of great value for hygienic as well as for therapeutic reasons. It is useful in the treatment of debility, anemia, hysteria, neurasthenia, muscular atrophy, and obesity. Gentle exercise is of importance in the case of ill-nourished children as well as for convalescents recovering from acute or chronic illness. Every physician ought to understand something of the methods of mechanical therapeutics and should avoid such expressions as "out-of-door life," "muscular exercise," and so on, when consulted as to the propriety of exercise in the individual case. For practical purposes the moderate use of dumb-bells, Indian clubs, developing machines, bicycle and horseback riding, walking, and similar methods of exercise will accomplish much in promoting the physiological function of organs.

Serum Therapy by the Mouth.—

PATON, D. M. *British Medical Journal*, No. 2366, p. 1032, May 5, 1906.

For eight years the writer has used serums by the mouth. Thus used their action is neither antitoxic nor antibacterial. But the theory which best explains their action is that of tissue resistance. The oral use of normal plasma of the horse, sheep, and ox in drachm doses four times a day restores lowered nutrition. The reaction leading to restored function is obtained in the presence of infections to which the animal itself is refractory. The serum of the horse and sheep is of great service in tuberculosis, but is valueless in influenza. Ox plasma is of the greatest service in influenza, as the animal is extremely resistant to that infection. The antidiphtherial serum is reënforced by the oral administration after it has been given beneath the skin. In such cases it materially assists the recuperative powers.

Saline Injections in Cholera.—

MCCOMBIE, F. C. *Lancet*, vol. clxx, No. 21 of vol. i, p. 1468, May 26, 1906.

The writer gives an account of his treatment of 105 cases of cholera with a mortality of only 23.8 per cent. He attributes these favorable results to the fact that subcutaneous injections of normal saline solution were employed. He refers to the fact that the previously reported unsuccess in their use is largely to be attributed to the fact that they were not employed in sufficient quantity nor often enough. The important point seems to be a rapid and continuous absorption. In two of the cases tried intravenously an addition of 10 minims of adrenalin chloride to the pint of salt solution was used. The immediate effect was marvelous, one patient arousing from a pulseless, dying stage to cheerful consciousness in half an hour. Adrenalin was tried in 10 minim doses by the mouth, and the results were so good that it is worthy of further trial.

Treatment of Diabetes.—

WILLIAMSON, R. T. *Medical Chronicle*, vol. xi, No. 2, p. 84, May, 1906.

The writer says that in the milder forms of diabetes satisfactory results can often be obtained by the use of aspirin with a slight restriction of diet. Aspirin has a distinct action in reducing the sugar excretion, and the reduction is not brought about by complications nor impairment of the appetite, but is due to direct action of the drug. In the severe forms of diabetes aspirin has often little or no influence.

MEDICINE.

The Blood in Lead Poisoning.—

CADWALADER, W. B. *University of Pennsylvania Medical Bulletin*, vol. xix, Nos. 2 and 3, p. 68, April-May, 1906.

The erythrocytes have been studied in lead intoxication, and it has been ascertained that they contain basophilic granules. They are occasionally nucleated red cells, megaloblasts as well as normoblasts. In a previous paper the writer attempted to show that there was a definite relation between the number of nucleated red cells and the number of non-nucleated red cells containing basophilic granules, and that the number of erythroblasts was not proportionate to the anemia. It was suggested that this blood picture was due to some toxic effect of the lead upon the hematopoietic organs. The present paper includes a series of observations upon the number and percentages of the white cells as well as the red blood corpuscles. The studies were made upon thirty-seven cases of lead poisoning presenting the characteristic clinical symptoms. The average percentage of hemoglobin was 65, and the red cells numbered 3,850,000. In every instance there was a marked increase in the number of granular red blood-corpuscles. Macrocytes and microcytes were occasionally met with, but poikilocytosis was not marked. One or more normoblasts were found in all but four cases, and megaloblasts in two instances, while in one case 130 normoblasts and 13 megaloblasts were found while counting 500 white cells, notwithstanding that the total number of erythrocytes was scarcely one-fourth less than normal after convalescence.

The nucleated red cells disappeared from the circulating red cells before the granular erythrocytes. The total number of red cells gradually approached the normal. In one case, the blood of which was studied during some length of time, the red cells had only increased 40,000 in four weeks after all symptoms had disappeared, while granular erythrocytes were still easily demonstrated. The intense pallor so characteristic of lead poisoning is not wholly dependent upon the anemia, but is possibly due to contraction of the peripheral capillaries. The leucocytes showed no morphological changes. The greatest number found was 12,550, while the lowest was 4700. There was an increase in the percentage of the large mononuclear lymphocytes.

An opportunity was afforded in both cases to examine the red marrow after death. The patient was admitted with the typical clinical symptoms of lead poisoning and died on the seventh day. The anatomical diagnosis was a chronic diffuse nephritis. The bone-marrow of the ribs was deep purple in color, while that from the central portion of the femur was yellow and fatty, but toward the head of the bone was a deep blackish-purple. The histological study showed the marked hyperplasia of the marrow cells, and the most striking feature was the great number of nucleated red blood-corpuscles. In this case no complete blood examination had been made before death, but the basophilic granulations had been found in great numbers. In no other secondary anemia does there seem to be such a great effort to repair so slight anemia as is shown in most cases of lead poisoning. It is possible that lead may destroy the red cells in the circulation, but it is probable that its greatest influence is exerted upon the cells of the bone marrow. Following the slight injury to the marrow cells there is overproduction, and in order to supply the necessary number of red blood cells many immature cells represented by normoblasts and megaloblasts are thrown into the circulation.

Diagnosis of Renal Functions.—

CABOT, R. C. *New York Medical Journal*, vol. lxxxiii, No. 29, p. 962, May 12, 1906.

The writer calls attention to the error of attempting to picture the morphology of the kidney. The only possible way of knowing how a kidney looks is to expose it by a surgical incision. The signs which have been hitherto considered evidences of kidney change are by no means conclusive any more than the cardiac signs which were formerly regarded as certain evidence of myocarditis. The signs that were once held to be pathognomonic of gastric ulcer are now known to be evidences only of weakened gastric function. So with the kidney it is functions, not appearances, that can be recognized. These are: (1) Renal irritation which shows itself in the presence of albumin and casts; (2) renal insufficiency

which may exist with or without albumin or casts, but betrays itself in dropsy, uremia, and other conditions; (3) nephritis which shows itself in the post-mortem appearance of the kidney. These changes are frequently associated, but not invariably, and if an inference is made of one from the presence of the other error is certain. Renal irritation or insufficiency may exist without nephritis, and the latter may be present without irritation or insufficiency. The discrepancy between urinary findings and post-mortem appearances has been borne out by a large number of observations.

The type of renal irritation most easily studied is that produced by violent muscular exertion. The urine almost invariably contains serum-albumin and casts. The albumin may reach 0 5 per cent with more or less blood, pus, and renal epithelium, and the casts be as numerous and as various as in acute nephritis. The urinary findings are such as are commonly held to indicate acute nephritis, but the rapid disappearance of the casts and albumin and the fact that such kidneys are found normal on post-mortem examination show that it is only a question of renal irritation. Large numbers of casts may be found in diabetes in which there is no demonstrable disease of the kidney on post-mortem examination. While the term irritation is vague, it is about the only term that will cover the wide range of interference with kidney function which is found in fevers, simple fatigue, presence of abnormal substances in the blood, and mechanical causes.

If a kidney fails in its excretion of water, urea, or the inorganic salts, there may be definite changes in other organs, such as uremia, dropsy, and cardiac hypertrophy. There is a close relation between heart and kidney. A strong heart will pull the system along even if the kidney is badly damaged. The harm done by a diseased kidney is dependent in many cases on how well the heart can make up for the damage by increased work. Kidney insufficiency is accompanied by changes in physical characteristics of the urine, the amount for twenty-four hours and the proportion of night urine to day urine, and by the group of symptoms characterized as uremia, dropsy, and cardiac enlargement. Evidence of irritation may be associated with these symptoms. In some cases the first and the only reliable evidence of renal insufficiency is the appearance of dropsy, uremia, or the heightened vascular tension that leads to cardiac hypertrophy. The methylene blue and iodine tests as well as cryoscopy will not give the measure of the deficiency before symptoms appear. A very simple test, and one to which insufficient attention has been devoted, is that which determines whether and to what extent the kidney is able to excrete a dilute urine after a profuse ingestion of fluid, or a concentrated urine when liquid is withheld.

In chronic diffuse nephritis the diagnosis can usually be made from the history, but in acute nephritis and in chronic interstitial nephritis mistakes are frequent. There are no characteristic urinary findings or symptoms in amyloid kidney.

In estimating the value of albumin and casts the most important element is time. There may be any amount of albumin and casts yet no nephritis, provided they do not persist, but chronic albuminuria with cylindruria usually means nephritis. The same is true of many of the other signs of renal insufficiency in relation to anatomical nephritis. Scanty urine, even anuria, or great polyuria with low gravity, may exist without nephritis. It is the persistence of these symptoms and not their presence that is serious.

Pulmonary Edema.—

COPLIN, W. M. L. *Therapeutic Gazette*, vol. xxii, No. 4, p. 217, April 15, 1906.

The writer analyzes 405 cases of pulmonary edema which were noted in making 2030 autopsies. He refers to the paucity of literature dealing with this important complication, which is due to the commonly accepted belief that the process is essentially agonal, and that patients get pulmonary edema because they are dying and not that pulmonary edema is the cause of death. That such an explanation is not justified is shown by the fact that the condition is absent in 80 per cent of bodies examined post mortem. In addition the pulmonary edema may be unilateral. Of the 405 cases noted by the writer, in 18 the right lung was involved and in 14 the left lung. The remaining cases had both lungs in-

volved. There are certain distinct forms of pulmonary edema that should be recognized. It may be local, diffuse, unilateral, bilateral, primary, or secondary. The local edema of the lung is commonly observed around inflammatory processes, infarcts, and neoplasms. Under such circumstances it is to be attributed to limited circulatory disturbances. Terminal edema due to a prolongation of the agonal period is always more marked in the dependent portions of the lungs. This type of pulmonary edema has little significance independent of the affection with which it occurs. The symptoms presented are attributable to the primary affection, and it is not established that the edema, unless extensive, exerts any important influence in determining the ultimate outcome of the case.

The writer recognizes two distinct groups of pulmonary edema, one in which it constitutes a part of a progressive dropsy and presents nothing distinctive. Especial attention is drawn to an acute, often fulminating, affection not accompanied by other manifestations of dropsy, and often rapidly fatal. The symptoms of acute pulmonary edema are characterized by sudden onset, rapid progress, and early fatal termination or a relatively quick subsidence. Repeated attacks are common. The attacks are more likely to occur at night, and come on with a rapidly developing sense of oppression. The patients seek an open window, and respiration, which is at first deepened and prolonged, soon becomes shorter and shallower. The face rapidly becomes cyanotic and cold perspiration appears. Occasionally there is intense pain in the chest. Death may take place in fifteen or twenty minutes in fulminating cases. A conspicuous symptom is the appearance of a pinkish or a salmon-colored expectoration. The quantity of fluid coming from the air-passages is sometimes very large. There are usually present the physical signs of heightened arterial tension. There are at first fine crepitant râles, followed by loud bronchial bubbling. The percussion note is higher or tympanitic, due to overdistention of the lobules with air, and the precordial dulness is commonly decreased. A number of drugs have been recommended in the treatment of this affection, based on various theories of their action. The one remedy that all authors are agreed upon as being the safest and most prompt is bloodletting. It lessens the pulmonary congestion and relieves the strain on the heart.

Dilatation of the Stomach.—

HEAD, G. D. *St. Paul Medical Journal*, vol. viii, No. 5, p. 278, May, 1906.

It is assumed that a stomach is dilated or displaced when its lower border if moderately distended with gas reaches below the umbilicus. In examining patients emphasis is laid on the importance of having the patient lie upon a flat table in a good light with the abdomen fully exposed. Inspection should be carefully made, care being taken to look sharply for the shadow phenomena of the stomach border and also for the peristaltic waves. The examiner should in the first inspection familiarize himself thoroughly with the general contour of the abdomen, so that when the stomach is dilated he will be prepared to note the changes which take place in the abdomen. The abdomen is then palpated, and finally the stomach outlined by percussion as accurately as possible and the borders marked with a pencil. It may be difficult to outline the stomach, especially if the abdominal wall is too tense or too lax. A distended colon is difficult to differentiate from the stomach before the latter is distended. The writer employs the gas method of distention, having the patient drink the tartaric acid solution (a teaspoonful of tartaric acid in half a glass of water), then lying down and taking slowly the bicarbonate of soda solution (a teaspoonful in half a glass of water) through a glass tube. It is important that the patient should take the soda solution lying down. The early changes in the contour of the abdomen produced by the swelling up of the stomach can thus be more accurately noted, and if there is a good light a glance will usually suffice to measure its size and note its position in the abdomen.

Careful inspection is too much neglected in determining the size of the stomach. When distended with gas the dilated stomach does not always take up the same place in the abdomen nor exhibit the same picture to the eye. It may stand out as a horseshoe-shaped body, the upper border at the umbilicus, the lower border above or in some cases at the pubis, the cardiac and pyloric end projecting

up toward the ribs to form the sides of the horse-shoe. Cases of enteroptosis and stenosis of the pylorus or duodenum from ulcer often present this appearance. It may take a more median position, the upper border being at the right costal margin, pressing against the under surface of the liver, with the lower border at or below the umbilicus. Enlargement caused by carcinoma of the stomach, stenosis from ulcer, adhesions between the pylorus or duodenum and the gall-bladder usually exhibit this form of dilatation. It may assume a more vertical position, the whole stomach lying in the abdomen to the left of the umbilicus, the bulging of the abdominal wall appearing in a zone on the left costal margin to a point at or below the umbilicus.

Percussion usually confirms what inspection has revealed. It helps to outline the upper and left boundaries of the stomach. Auscultatory percussion is also of value, the abdominal wall being lightly tapped with the finger while the bell of the stethoscope is placed on the abdominal wall over the pyloric region.

Effects of Muscular Exercise on the Heart.—

MEYLAN, G. L. *Journal of the Medical Society of New Jersey*, vol. ii, No. 11, p. 332, May, 1906.

Muscular exercise is the most important factor in developing the heart. It strengthens a weak heart and improves an undeveloped and small heart. The subjective symptoms accompanying poor circulation are pale skin, coldness of the extremities, and shortness of breath. Such conditions are commonly found in individuals leading a sedentary life and after convalescence from acute diseases. That the heart may keep up its normal strength it must have a reasonable amount of work to do. Those who take a minimum of muscular exercise find that slight exertion produces palpitation. A weak heart from such a cause is not to be considered diseased, and yet it may produce many symptoms of illness. The writer, who is professor of physical education in the Columbia University in New York, has been impressed with the remarkable results obtained in improving the size, strength, and function of weak hearts by systematic exercise. The characteristics of weak heart are a fairly rapid pulse in a horizontal position, about 80, an increase to about 100 when standing, and a very marked increase after strength tests, the pulse often running up to 150. When there is a difference of more than 25 beats between the pulse in the horizontal and vertical positions other signs of cardiac weakness should be looked for. The change noted after sudden muscular exertion is also a valuable indication.

In testing the effect of systematic exercise on the heart the writer has carefully tabulated 465 cases of men examined at the beginning and at the end of a season of gymnastic exercises. The average pulse-rate before the strength test at the first examination was 89; at the second examination the average pulse had fallen to 82. The pulse after the strength test at the first examination was 135, and 132 at the second examination. There is a decrease in the pulse in both cases, although the decrease after the strength test is only three, against a decrease of seven at rest. The difference between the figures noted while at rest and those obtained after the strength test is more apparent than real, as the training during the period had resulted in nearly doubling the work done in the strength test. Of 18 football players it was found that after eight weeks' training the average pulse had decreased six beats per minute. The difference in rate between the pulse in the horizontal and vertical positions had decreased to an average of 10 beats at the end of the season. That excessive muscular exercise may have an injurious effect on the heart there is a little doubt, although this phase of the subject has not been investigated as fully as it should be. These injurious effects come almost entirely from the practice of athletic sports and exercises. The most dangerous sports for the circulatory organs when indulged in to excess or practiced by weak and undeveloped individuals are basket ball, cross-country running, rowing, hockey, water polo, and distance running.

Myoclonus Multiplex.—

DYKES, C. *Lancet*, vol. clxx, No. 19 of vol. i, p. 1319, May 12, 1906.

The patient first came under observation in July, 1905. The muscular spasms had been noticed for five months. The left arm was first affected, then the neck, and later the right arm. When he was first seen the whole upper part of

the body was in a state of constant jactitation, the arms were violently extended at the elbows, the spine was arched, the head was overextended, and the shoulders were drawn back. The disease first appeared in the rectus and external oblique muscles of the abdomen, together with the gluteus and tensor vaginæ femoris of both sides. In the early stages of the disease these contractions did not attract the attention of the patient. Later the muscles of the upper limbs, neck, and back became involved, and certain muscles or groups of muscles, such as the triceps or trapezius or one or more of the muscles attached to the vertebral border of the scapula, would have a succession of contractions following each other so rapidly that there was more or less complete tonus. In these contractions the forearm was sometimes forcibly extended on the arm and the head on the trunk, the trunk being arched backward and the shoulders thrown back. When the attack was at its height several or all of these effects were produced together, or followed each other in rapid but irregular sequence. Each contraction appeared to last two or three minutes, and was then followed by a short period of rest; then a fresh series of contractions, until apparently exhaustion of the muscles brought temporary relief. The flexor muscles of the arms and the deltoids and the muscles of the forearms remained unaffected, as did the pectoral, for a long time, but they have recently shown the partial contractions which have been noted in the abdominal muscles. The extrinsic muscles of the eyes have so far escaped, but the orbicular spasm is so pronounced that only a single glance can be taken in any one direction. The movements are apparently less when lying down, and they cease during sleep. The general health is unaffected, except in so far as the movements cause a painful fatigue. Of late the disease has begun to affect other muscles, such as the hamstrings, temporals, and masseters. During the eight months that he has been under observation the abdominal muscles, of which at first only small segments were involved, have become more extensively affected. Relief has been obtained by the use of belladonna preparations, whether administered internally in the form of extract or hypodermically in the form of atropine, and the application of a constant current to the spine. Shortly after the onset of the disease the patient began to take opium, and although he has used as much as 24 grains no good effects can be attributed to it.

Hysterical Swelling of the Hand.—

GORDON, A. H. *Montreal Medical Journal*, vol. xxxv, No. 5, p. 328, May, 1906.

The patient was a young woman 18 years of age, by occupation a photographer's assistant. On waking the hand felt awkward and somewhat painful. The following morning it was found to be swollen, with some pain over the wrist extending up to the forearm. There was no feverishness nor headache. The family history was neurotic, and the mother suffered from arthritis deformans. One sister has had major hysteria, having had at different times a hysterical hip-joint, talipes, cataleptic attacks, epileptiform convulsions, retention of urine, hysterical vomiting, aphonia, and for several years has been anesthetic to pain. The patient was a well-nourished girl with good color, temperature of 98°, pulse 70, and respirations 24. The left hand up to one inch above the wrist-joint was tensely swollen and of a pearly-bluish color, and distinctly colder than the right. There was no pitting on pressure, no spontaneous pain, but some tenderness on pressure over the wrist-joint and a constant heavy feeling up the left arm. There was some degree of loss of power in the fingers, and the normal movements of the wrist were almost absent. With difficulty a pin or coin was picked up with the eyes open. Over the whole left side as far as the middle line there was diminution of pain sense. There was submammary and iliac tenderness, distinct globus hystericus, pharyngeal reflex absent. The field of vision to rough tests was not diminished. The pupilary reflexes and knee-jerks were present. There were no visceral manifestations and no signs of obstruction in the arm. The arm was placed in a splint; in three days the swelling diminished, and in a week had completely disappeared. With the disappearance of the swelling the power of movement returned to the hand and sensation returned, touch appearing first, then heat, cold, and pain. The patient has had one slight attack of a similar character since.

The hysterical character of the symptoms was

shown by the absence of venous or lymphatic obstruction and the fact that the pulse was normal at the wrist. There were no associated febrile phenomena, and a localized neuritis was excluded by the limitation of the trouble within the distribution of several nerves, and its limitation to a line drawn at right angles to the axis of the limb.

The Mental Disturbances of Alcoholic Neuritis.—

CORIAT, I. H. *American Journal of Insanity*, vol. lxii, No. 4, p. 571, April, 1906.

The writer refers to the vagueness with which the words delirium, stupor, and dementia are applied to the associated mental states accompanying alcoholic neuritis. He believes that the time has come in which clinical studies can lead to sound generalizations. Attention is called to the fact that there may be several distinct varieties in the neuritic disturbances, such as peripheral ocular palsies or a complete ophthalmoplegia. These cases may resemble acute polioencephalitis. There may be a peripheral neuritis in the ordinary acceptance of the term, with associated central changes and degeneration of the posterior columns which may at times resemble tabes. The peripheral neuritis may at times be absent. Sometimes there is a combination of peripheral and central changes associated with the mental picture. There may exist the psychosis described by Korsakow, but this may occur without a peripheral neuritis, and in addition it may be due to factors other than alcohol. The ordinary delirium tremens may be of acute onset and associated with signs of peripheral neuritis, giving an acute form of Korsakow's syndrome. It is these types which show the close relation between delirium tremens and Korsakow's disease.

The Physiology and Pathology of the Arterial Pulse.—

CURL, S. W. *Lancet*, vol. clxx, No. 16 of vol. i, p. 1091, April 21, 1906.

The arterial pulse represents in the main the sudden increase of pressure occurring in the arteries as a result of the injection into them of the blood from the left ventricle. It travels from the heart to the peripheral parts in the form of a wave, diminishing in size as it passes along. The pulse curve represents the changes within the artery at the part under examination. Its form varies according to the force of the contraction, to the blood-pressure, to the condition of the vessel wall, and to the distance of the vessel from the heart. The sudden increase of pressure in the arteries having reached its maximum, this is followed by a fall, which is interrupted by a slight increase of pressure as the dicrotic wave appears. This wave seems to arise from the closed aortic valves. Of the secondary waves but little is known of their origin. The factors which alter the pulse are the heart muscle and the proper performance of its function, the condition of the vessel walls, the state of the arterioles, the nervous mechanism regulating and controlling the heart-beat. In some abnormal pulses the manner in which the changes are produced is obvious, while in others it is only a matter of conjecture. Of the pathological pulses few if any are characteristic of the diseases producing them; in the large majority of cases no specific alterations are produced. High tension is not infrequently overlooked in arteries which are naturally small or are abnormally retracted. In such cases the sphygmograph is useful, and it may demonstrate high tension that is scarcely appreciable to the fingers. In some cases the pulse is a valuable assistance in prognosis; it often indicates the necessity for the exhibition or withdrawal of drugs, and is often a guide to the rational treatment of many diseases associated with circulatory disturbances.

Angina Pectoris as an Early Symptom of Aneurism of the Aorta.—

OSLER, W. *Medical Chronicle*, vol. xi, No. 2, p. 69, May, 1906.

Pain is one of the earliest and most constant symptoms in aneurism of the aorta. It was present in 104 cases out of 132. It is surprising that pain should ever be absent, and yet some patients may have erosion of the spine and perforation of the chest wall with no pain. The pain in aneurism may have the characters of a true angina, with paroxysms of maximum intensity associated with radiation to the arm. This anginal type occurred in 22 cases. A second type of pain is that due to direct pressure on the nerves. It is sharp and neuralgic in character, often extending along the course of the nerves. This is the most

common type, and it also may be paroxysmal and vary greatly in intensity. The pain is similar to that which is met with in pressure from pelvic tumors and in disease of the vertebra. A third type of pain is dull and boring in character, and is most common when the sac is eroding the chest wall or the spine. It is not always easy to distinguish this from the second variety, but patients say that they can appreciate the difference, and it is this form that is the most enduring and the most severe. It seems to be due to tension and stretching of fibers rather than to pressure upon nerve cords. A fourth type of pain is referred to the nerves of the arms or to the skin in the precordial region, or to the pectoral or to the sternocleidomastoid muscles. Pain down the left arm is very common, and was a marked symptom in 22 cases.

Especial attention is directed to cases of angina pectoris which precede for months or years the appearance of the aneurism. The paroxysms may be of the most typical character and not the slightest suspicion may be entertained of the true nature of the case. The attacks are associated with early structural changes in the wall of the aorta. The histories of four cases are given, in which typical symptoms of angina pectoris preceded by a year or two the development of an aneurism.

Fatigue.—

LEE, F. S. *Journal of the American Medical Association*, vol. xlvi, No. 20, p. 1491, May 19, 1906.

The writer reviews the known facts and theories regarding the phenomena of fatigue. He shows that physiologists are generally agreed as to the facts of muscle fatigue, but the condition of the peripheral nerves and nerve centers is still a subject of dispute. The recent results would indicate that the muscular system tires before the nerve centers. They also throw a certain measure of doubt on the supposed proofs of central fatigue. A physiological explanation of the facts of mental fatigue is not possible in the present state of research. There is no denying the fact of psychical fatigue, but it is unknown whether it is of central or peripheral origin. Metabolic products, such as sarcolactic acid, monopotassium phosphate, and carbon dioxide, have a toxic depressant action especially on the muscular system, and the sensation of fatigue is in large part the psychic manifestation of this depression. Little is known as to the production of fatigue substances in the central nervous system, but the action of such substances is not confined to the tissues in which they arise; excessive activity of one tissue can cause fatigue of others. The effects of acid intoxication are similar to fatigue phenomena. There has been very little serious endeavor to provide specific antidotes for fatigue considering its importance. Alcohol in small amounts seems to have a favorable action, but it is followed by bad after-effects and cannot be classed as a valuable antidote. A true antidote must recognize the causes. Both scientific and unscientific experiences have shown the value of sugar as a partial restorer of working power. An alkali such as sodium bicarbonate may not be without value.

SURGERY.

Certain Derangements of the Knee.—

JONES, R. *Clinical Journal*, vol. xxviii, No. 4, p. 51, May 9, 1906.

The writer believes that the term "derangement" is sufficiently explicit as applicable to certain changes in the knee-joint. It conveys the suggestion of mechanical disability rather than of progressive disease. There is often great difficulty in making an accurate diagnosis. During exertion of varying kinds something is felt to give way in the knee, and the symptoms which follow differ widely. In one case the joint may have locked, in another there is acute pain or obstinate effusion, while in still other cases pain, effusion, or locking may be absent, and yet the diagnosis in each case may be the same. The writer includes under derangements synovial fringes, joint lipomata, loose bodies, exostoses, injuries to the crucial ligaments, recurring dislocation of the patella, injuries and displacements of the internal semilunar cartilage.

The anatomical arrangement of the joint is such that there is a close association between injuries to the lateral ligaments and displacement of the semilunars. The internal and external semilunars are two dense crescentic plates of a compact structure attached by their outer convex margin to the capsule of the joint. They cover almost

two-thirds of the articular surfaces of the tibia. On section they are wedge-shaped, tapering from their outer thick base to the inner free border. They increase the concavity with which the femoral condyles articulate. Their lower tibial surfaces are flat, and both the tibial and the femoral surfaces are free, and what is important clinically, both surfaces are covered with synovial membrane, so that in all movements of the knee-joint the femur and tibia put direct pressure upon the reflecting synovial sac. This bears a close relationship to the effusions which so often follow an injury. Both cartilages taper to their attached ends, which are in front of and behind the tibial spines. The attachments of the external cartilages are within those of the internal. For this reason the external cartilage is more circular than the internal, which is oval in shape and which is longer from before backward. The external cartilage is more movable than the internal, which is not pronounced because of the laxity of the part of the capsule to which it is attached. In thin people the prominent inner margin of the internal cartilage can be felt between the bones in front of the internal lateral ligament. The rim of the external cartilage in front lies more within the joint and cannot be felt. Both cartilages on their convex border are attached to the capsule of the joint and to the posterior crucial ligaments behind. It is clinically important to note that the external cartilage is not attached to the external lateral ligament, while the internal cartilage is very firmly attached to the internal lateral ligament. The union of the external cartilage to the capsule is less firm than in the case of the internal because the anterior end is nearer the center of the joint, and posteriorly the tendon of the popliteus separates it from the capsule.

Bending inward of the knee in the extended and semiextended position is prevented by the internal lateral ligament. Bending inward of the knee during the fully flexed position is prevented by the crucial ligaments. This arrangement shows how the lateral ligament so frequently suffers injury. It is subjected to strain whenever the foot is firmly planted and abducted and the knee either slightly bent or kept extended. If in addition to that the body weight with rotation of the femur is added the strain falls directly on this ligament. The strength of the knee-joint can be gauged by the resisting power of the internal lateral ligament. The internal semilunar is attached to the tibia in front by fibrous bands running toward the tubercle. Circumferentially it is attached to the tibia in such a way that the cartilage can be lifted up fully a quarter of an inch. In the middle it is braced by a firm fibrous band which merges into the strong internal lateral ligament. The practical interest of this attachment is that this ligament keeps the cartilage fixed to the femur in rotation of the joint. Any traction exerted upon the upper part of the ligament falls upon the so often displaced anterior portion of the cartilage. If the internal lateral ligament be torn above the level of the joint the cartilage remains upon the tibia; if torn below the level of the joint it follows the rotary movement of the femur. If the ligament be ruptured above and below the level of the cartilage it becomes a simple matter to push it within the joint. Displacement or fracture of the cartilage can only take place when its circumferential and suspensory attachments are torn, and when the internal lateral ligament is stretched or ruptured. This allows a separation of the joint surfaces and a slipping inward of the cartilage. As the separate bones snap back the cartilage is nipped and the knee is fixed in a painful manner. The pain and effusion can be ascribed to injury of the synovial membrane with which the cartilages are covered. In the majority of instances the cartilage is displaced inward, and where a protrusion can be felt from the outside it is due to a buckling of the cartilage. In over 100 cases the writer has never met with a displacement outward not accompanied by a correlated displacement inward. A displacement outward cannot cause a locking of the joint. This can only occur when the displaced cartilage acting as a foreign body gets jammed between the bones.

The most constant symptom of displacement of the semilunars is a sudden inability to fully extend the joint, the cause being due to a strain of the internal lateral ligament while the knee is flexed and the femur rotated inward. The force necessary in a first injury is considerable. The pain is acute and the knee is soon distended with fluid. After massage and rest the patient is allowed to walk. This walking is objectionable from the standpoint

of treatment. Days, weeks, or months may elapse, when there is a repetition of the symptoms, but less severe. This recurrence is followed by others, some grave and others very slight. In some cases any eversion of the foot will give rise to a displacement. Of 26 cases upon which the writer operated, 13 were torn from their anterior attachment, 4 were longitudinally split, 2 were displacements of the posterior horns, 2 were loosely bound circumferentially, 2 were attached by their cornua and detached into the joint centrally. Three presented pedicular enlargements of the anterior portions. The writer has only seen six cases of complete fracture of the semilunars, and in each case the fracture was opposite the internal lateral ligament. Some cartilages which have been removed have undergone changes which make them hardly recognizable. Loose bodies in the joint may give rise to similar symptoms.

The most common injury to the knee-joint is a sprain or rupture of the internal lateral ligament, which is commonly called a sprained knee. A distinction should be made between primary and recurrent luxation, and operation should not be done except in the recurrent cases. A time comes when the battered and injured cartilage must be removed, but before these changes have taken place, if there is perfect reduction and all move ment is checked and no lateral strain is allowed on the internal lateral ligament, the joint will recover its tone and strength. In reducing it does not matter what method is employed providing full extension is secured. One should not be content with a partial flexion, but full and easy extension is what shows that the cartilage has been replaced. The retention of the cartilage in a fixed position can only be secured by a fully extended limb. In the treatment rotary and lateral movements of the joint should be prevented. Rest of the limb in a fully extended position is indicated as long as effusion lasts. Flexion should be avoided as it tends to displace the cartilages. One of the simplest methods of preventing strain of the internal lateral ligament is to walk on the inverted foot with inturned toes. In cases in which the cartilages are displaced at frequent intervals the heel and the sole of the boot should be so altered as to invert the foot. While the immunity conferred by such a device is not complete, it is a valuable asset among the remedies. Lateral displacement and rotation can be prevented by the hinged, metallic splint of Griffiths. This mechanical treatment is useful in the early cases before the semilunars have been damaged by repeated injuries. Operation is to be urged where there is a recurrent displacement followed by acute symptoms. The results of removal of cartilages are excellent, and where there is a recurrence of symptoms after their removal it is probably due to some other overlooked derangement in the joint.

An Operation for Chronic Dilatation of the Stomach.—DONALDSON, H. J. *Surgery, Gynecology and Obstetrics*, vol. ii, No. 4, p. 403, April, 1906.

The operation is termed gastroplication, and with its various modifications has been performed seventeen times. It consists in folding in the anterior wall of the dilated stomach, bringing the greater curvature into normal relation with the lesser one. Suturing in this way is easy, as the

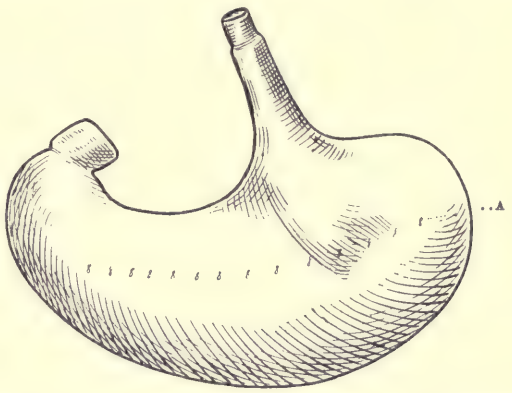

FIG. 1.—A, showing interrupted silk suture in place, completing operation by reënforcing second tier of Lembert silk sutures and burying all sutures.

walls of the dilated stomach are usually thickened. What becomes of the infolded portions is not definitely known. It is not applicable to cases of organic stricture of the pylorus, but it will relieve spasm of the pylorus. It has a great advantage over gastrointestinal anastomosis, as it preserves the function of the stomach, which is more or less lost in the latter operation. The operation proposed by the writer is a modification of Bickham's, but in the original no effort is made to eliminate the dead space between the sutures. Weir modified this operation to eliminate the dead space, but

did not scarify the peritoneum so as certainly to secure early and strong adhesions.

A case in which the writer performed this operation was seen in June, 1904. The incision in the abdominal wall was made between the xiphoid appendage and the umbilicus. Through this incision the stomach, which rested upon the uterus and bladder, was taken out. The plication operation was then begun by introducing twelve Lembert sutures about one-half inch apart near the border of the cardiac end of the stomach. The needle was buried for one-half inch, then skipping two inches, and again buried one-half inch. The catgut suture was introduced continuously, commencing at the cardiac end about one inch from the first silk suture (Fig. 1). After carefully scarifying the surface in the fold the ends of the gut suture were pulled tight. Then the Lembert sutures were tied and reënforced by a continuous catgut suture which extended to the beginning

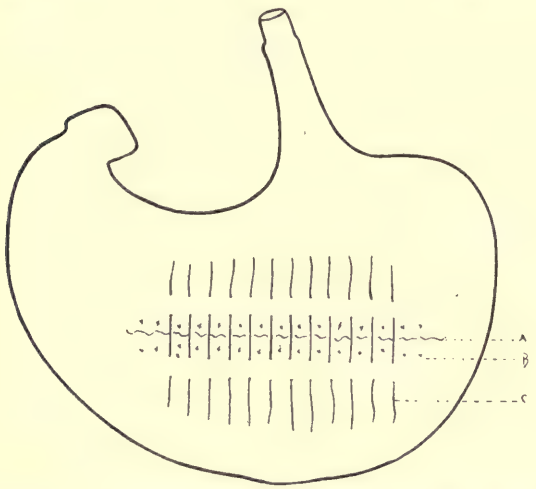

FIG. 2.—A, showing continuous gut suture rëenforcing and hiding first row of Lembert sutures; B, scarification; C, second tier of Lembert suture.

and end of the first catgut buried suture. The second row of Lembert silk sutures was introduced in the same manner (Fig. 2), covering this time two inches of stomach wall. After scarifying and tying they were rëenforced by fine silk sutures placed about one-half inch apart, and hiding all infolded portions. The first row of sutures infolded three inches of stomach wall and the second row two inches, making five inches in all, and bringing the two curvatures within about four inches of each other. The patient made a good recovery, and now nearly two years after the operation the stomach has apparently its normal capacity. After the operation the patient gained over 40 pounds in weight.

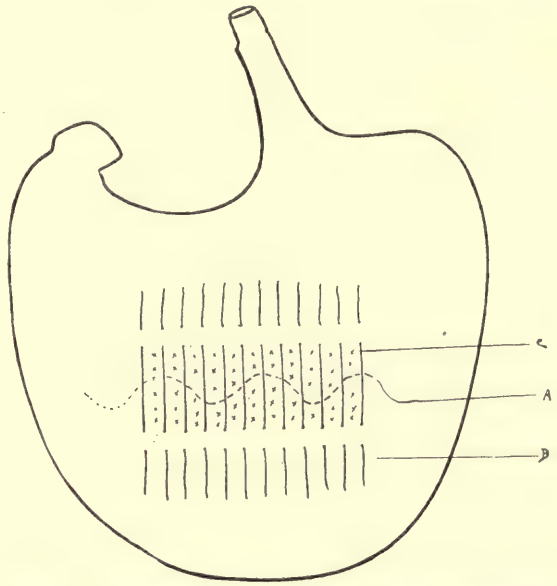

FIG. 3.—A, catgut suture introduced in depth of first fold to obliterate dead space; B, Lembert silk suture *in situ*—when tied will hold in 3 inches of wall; C, scarification.

The only advantage that can be claimed for a gastroenterostomy is that it saves time. The operation performed lasted one hour, but the longer time of operation is compensated by the fact that the danger is less, and there is no possibility of a vicious circle being established or a regurgitation of bile.

Treatment of Varicose Veins.—

MAYO, C. H. *Surgery, Gynecology and Obstetrics*, vol. ii, No. 4, p. 385, April, 1906.

The veins generally involved are the long and short saphenous, and the causes of the condition are obscure. Congenital defect is a probable cause, as the condition is frequently noted as early as the second decade. It is probable that normal veins will not give way under the strains of ordinary life. The common symptoms are a sensation of fulness or weight in the legs, edema in the standing position, and pain from nerve irritation. Many patients recognize their trouble, but

others consult for symptoms resembling those of sciatica or even flatfoot. The competency of the valves is tested by having the patients lie down and compressing the saphenous vein at its upper portion, then having the patient assume the upright position. If the vein fills from below the valves are intact, but if the wave of blood descends the valves are useless, and for such cases the Trendelenburg operation is indicated.

The writer has operated in 185 cases of varicose veins many times upon both legs. The complete Schede operation has not been made for several years, but a partial Schede or oval or interrupted incision above or about a large ulcer is frequently made, combined with the excision of the ulcer and skin-grafting. At the same time the Trendelenburg operation or the more extensive excision of the internal saphenous vein from the upper third of the thigh to a point 6 or 8 inches below the knee is often performed. The removal of short venous areas is reserved for cases of involvement of the veins of the posterior thigh or the external saphenous. Excision of the long saphenous is the best operation in the majority of cases. Formerly the vein was removed through long incisions, but of late it has been found practical to enucleate the vein by subcutaneous dissection, using for this purpose a quarter-inch ring of steel with a long handle, the instrument being not unlike a blunt uterine curette. With such an instrument it is possible to remove the whole vein through three or five incisions, each of which is not more than an inch in length. The vein is sought for and severed in the upper third of the thigh. The proximal end is ligated, the lower end is passed through the ring of the enucleator or placed in the ring of the forceps, and clamps are placed on the end of the vein. With gentle force, the vein being held so as to make it taut, the ring is pushed down the vessel for six or eight inches. It is then forced against the skin from beneath and a small incision made over it and the vein lifted up, after which the instrument is withdrawn, to be rethreaded at the new opening to be pushed to a lower point. Should the vein break a new incision is made below the knee and the vein exposed and divided, and enucleation made in both directions from this point. When the venous wall is found to be calcareous or greatly degenerated the open method of treatment must be substituted, leaving only the section at the knee for undermining.

In the operation hemorrhage is avoided by having the leg raised in a straight or extended position and supported at the ankle. Should any branches cause more than ordinary hemorrhage it can be checked by pressure pads. The subcutaneous removal of the internal saphenous vein from eight inches above the knee to four inches below accomplishes all that can be done by the Trendelenburg or Schede operations. In cases with ulcer and eczema the ulcerated area may be skin-grafted at the time of the operation. The eczematous area can be sealed with a solution of guttapercha in acetone, which will prevent infection of the wound. The results on the whole are satisfactory, but there are some dangers connected with the operation, such as sepsis and pulmonary embolism. Recurrences are not infrequent, as the smaller lateral branches of the saphenous may become as large as the original trunk.

Osteomyelitis.—

GARROW, A. E. *Montreal Medical Journal*, vol. xxxv, No. 4, p. 246, April, 1906.

In the discussion of osteomyelitis the writer limits the term to an infection of the marrow of long bones, though a similar process occurs in the cancellous tissue of irregular bones and in the diploic tissue. In the operative treatment of infective osteomyelitis attention is called to the work of Nichols, who directed attention to the importance of saving the endosteal tissue in the acute stages, at the same time providing for drainage. In the acute stage he advises early opening of the bone with the trephine, and enlarging this upward and downward so far as bone infection can be demonstrated. The parts are not curetted, but simply drained. If sufficient endosteal tissue is preserved rapid repair and filling of the cavity may take place. In the subacute stage the dead and dying bones should be removed when the actively proliferating periosteum is about 1-16 of an inch in thickness. The periosteum has usually acquired this thickness in about eight weeks from the time drainage is established, and though it is somewhat stiff it can be molded and will retain its shape. When the disease involves one or two parallel bones, this time is chosen to perform sequestrotomy. The

periosteum is carefully stripped from the bone throughout its diseased area, and the bone cut through above and below, the section being made in healthy bone tissue. The bone is removed and the interior of the periosteal shell is sponged, infected-looking areas are curetted, the interior is swabbed with carbolic acid and alcohol, and the edges are united by sutures. Drainage is provided at the lower end of the cavity. Such an operation will secure almost a perfect anatomical shaft. In 1897 the writer removed the entire shaft of the tibia by this method. Healing took place rapidly, and now there is little to indicate that such an operation has been performed. Where there is but one bone the operation must be performed about sixteen weeks after opening and draining. In these cases the periosteal shell will have become more rigid, and it has not as much power of central proliferation as earlier, hence the after-treatment is prolonged.

Chloride of Lime in Surgery.—

STEWART, D. H. *Annals of Gynecology and Pediatry*, vol. xix, No. 5, p. 261, May, 1906.

Attention is called to the value of chloride of lime or calx chlorinata as a surgical disinfectant. As frequently found in the market, especially in grocery stores, the cost of this substance is about 25 cents a pound, and it contains from 12 to 20 per cent of chlorine. A good quality such as that made by Squibb contains from 30 to 35 per cent of chlorine, and costs 33 cents per pound. The cruder grades are the most irritating. Surgeons employ all sorts of disinfectants—one for instruments, another for the hands, employing one solution to wash the abdomen, another to douche the vagina, and still another to wash out the rectum, all on the same patient. This means delay, fuss, and unnecessary work. The writer advocates the use of a single disinfectant such as calx chlorinata. It is a most effective hand sterilizer, though as commonly employed it causes more or less eczema. The writer deprecates the use of soap in cleansing the hands, and he does not advise the scrubbing-brush, substituting for them sapolio, granulated sugar, aluminum sulphate, and Squibb's chloride of lime.

In cleansing the hands the surgeon should remember that the danger lurks about the nails, and it is here that the closest and greatest amount of rubbing should be done. The writer's method of sterilization is to use sapolio, avoiding scratching or roughening the hands. After the sapolio has been reduced to a white cream, then the friction should be applied. A teaspoonful of granulated sugar should be poured into the palm and rubbed into the sapolio cream. The sugar furnishes quite as much friction as the scrubbing-brush, but it is more evenly distributed and there is not so much damage to the skin. It is important to take plenty of time and use the sugar as long as there remains any grit, or until it is syrupy. The sapolio and sugar is then washed off the hands, and the skin will be found noticeably soft and pliable. Then plunge the hands into a solution of one quart of water in which have been dissolved two heaping teaspoonfuls of chloride of lime and one heaping teaspoonful of aluminum sulphate. The fingers are then successively plunged as far as the root of the nail into dry chlorinated lime. It is worked under and around the nails. The lime is then worked down the fingers and onto the palm of the hand, but it should be creamy, as a single lump will cause a dermatitis. The sensitive back of the hand should be left alone. The hands should then be plunged into the alum sulphate and chlorinated solution, and no greater friction should be employed than is furnished by a sterile cotton wad. If gloves are used they should be drawn on before the hands have had time to dry.

Fatalities under Ethyl Chloride.—

LUKE, T. D. *Lancet*, vol. clxx, No. 18 of vol. i, p. 1233, May 5, 1906.

Up to date the writer has been able to collect twenty-two fatal cases, the histories of some of which are fairly complete as to details. It is not supposed that the list is anywhere near complete. The writer deprecates a too indiscriminate and too enthusiastic employment of this anesthetic; at the same time he condemns its rejection and the use of chloroform where an anesthesia is required, however brief. In analyzing the fatal cases a number of them were found to be bad subjects for any anesthetic, and a few might have been more safely anesthetized by chloroform. In only three of the twenty two cases was there a fair inference that the ethyl chloride acted unfavor-

ably in patients who were not suffering from constitutional disease and who were not chronic alcoholics. Eight of the twenty-two fatal cases occurred during dental operations. A rough calculation of the death rate under ethyl chloride makes it about 1 in 8000, which shows that it is a comparatively safe anesthetic, certainly far less fatal than chloroform for short operations. With the exception of the administration of ethyl chloride for the extraction of teeth it is most frequently used for the removal of adenoid growths of the nasopharynx. In the throat department of the Royal Infirmary, Edinburgh, it has been administered upward of 1500 times without a mishap. The writer has administered ethyl chloride on considerably over 2000 occasions, and has not had a single fatality, and nothing worse than two cases of temporary respiratory arrest with considerable cyanosis and dilated pupils. One of these cases was alarming and demanded immediate and careful treatment.

In administering ethyl chloride one should be prepared to meet ordinary emergencies, as they come on with a rapidity not exceeded in chloroform anesthesia. In the writer's opinion the fatalities so far reported should discourage the promiscuous and irresponsible use of ethyl chloride, but should not discredit it; it should rather take its place as a valuable addition to the anesthetist's armamentarium in properly selected and suitable cases.

The Repair of Defects of the Skull.—

ALLEN, D. P.; SANFORD, H. L.; and DOLLEY, D. H. *Boston Medical and Surgical Journal*, vol. xliv, No. 15, p. 396, April 12, 1906.

The writers discuss the relation of defects of the skull to epilepsy, and give a clinical and experimental study of repair of defects in the skull. They have shown in operations upon man as well as upon animals that defects in the skull can be successfully closed by transplanting a graft composed of the outer table of the skull. The outer table of the skull is removed with the periosteum attached, and is placed in position over the defect. It soon becomes united with the edges of the opening, and in animals after a period of about three or four months the bony outline of the skull is fully restored. The graft grows in thickness and enlarges at the edges. The methods proposed by the writers are substantially the same as those that have been formerly advocated, the difference being that the graft that was formerly used had a pedicle, which the writers hold to be unnecessary. If their assertion is true that no pedicle is necessary to preserve the vitality of the bone graft, it furnishes a ready method of closing large defects in the skull. The importance of such a surgical procedure need hardly be emphasized.

Strangulation of the Small Intestine Through a Slit in the Omentum.—

GOODMAN, C. *Medical Record*, vol. lxix, No. 18, p. 713, May 5, 1906.

The case of a man is reported who developed a right hernial swelling after an accident two years before admission to the hospital. Three days before admission he was seized with sudden acute colicky pain in the abdomen after his evening meal. The pain continued throughout the night. He had a small, easily reducible bubonocele on the right side. When the incision was made in the abdomen several coils of distended, congested, and lymph-covered small intestines forced themselves through the wound. A mass of collapsed small intestine and omentum was found in the right iliac fossa. A coil of small intestine about eight inches long passed through an opening in the omental apron about one inch from its free border. It was twisted on itself and strangulated, forming a volvulus, and it was firmly wedged in the omental slit. The omentum was divided from the free border through to the constricting slit, thus releasing the strangulation. The redundant edges were ligated. The patient made an excellent recovery.

End Results in Appendicitis.—

BALLOCH, E. A. *American Medicine*, vol. i, No. 1, p. 22, April, 1906.

It has been the custom of the writer to remove the appendix when the abdomen was open, whether the appendix was primarily involved or not. In an effort to confirm or refute this practice twenty-five especially selected cases were chosen for study. It was manifestly impossible to use cases in which abdominal section had been made for some other purpose, as this might obscure the results of the appendectomy. The cases were all in private

practice, the patients were intelligent, and the appendix had been removed for chronic or quiescent disease. Eighteen of the twenty-two cases that answered stated that their general health had been improved, and four that they could note no change. None reported themselves worse. In respect to the abdominal symptoms sixteen noted improvement, five noticed no change, while one patient reported that she was worse, but gave no details. The bodily weight was reported increased in more than half of the cases, and none noticed any bad results attributable to the operation.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Tics in Children and Their Educational Treatment.—

HERRMAN, C. *Archives of Pediatrics*, 23d year, No. 6, p. 426, June, 1906.

Reference is made to the fact that many of the tics which are so annoying in adult life have their origin in childhood. Too frequently tics are regarded as simply bad habits which will be outgrown, not recognizing that it is a symptom of a peculiar mental state which should be regarded as a warning. Like other neuroses, tics have their origin in an inherited predisposition and in faulty environment, which includes the method of training. Tics are rarely seen before the fourth year, the period of greatest incidence being from seven to eight years. In predisposed individuals comparatively slight mental or physical causes may produce the condition. Imitation may play a part, and several children in the same family may be affected. Frequently the movement or gesture is originally performed with a purpose. The child with a granular conjunctivitis or foreign body in the eye may blink in the endeavor to remove the irritation. The rough edge of a collar may scratch the neck so that the finger is run along the inside of the collar to separate it from the neck. In the normal child, as soon as the source of irritation is removed the act is unnecessary and ceases, but not so with those who have a tendency to the development of tic. Here the action continues in response to an irresistible impulse. These patients lack mental equilibrium, the will is weak, and it is difficult for them to concentrate the attention; they are impulsive, restless, impatient, and irritable. With these symptoms there is often associated imperative desires to do or say certain things.

Of the endless variety, by far the most common form in tic is blinking of the eyelids, which may occur alone or associated with other movements of the face, head, or shoulders. A form frequently overlooked is the sucking or licking of the lips. This ultimately causes an eczema around the mouth, which in turn leads to itching and burning. The only way to control the local skin lesion is to overcome the habit. Another frequent form is a long-drawn inspiration with or without a sigh. Quick nodding of the head is frequently seen in girls. This may have its origin in the use of large and heavy hats, and may continue after the necessity for the movement is gone. The "mental torticollis" of the French, in which the head assumes more or less permanently an abnormal position, may have its origin in some painful condition and the habit persist after the cause is removed. Stammerers frequently make use of a tic like movement to assist utterance. Certain stereotyped movements, gestures, and attitudes present in patients otherwise normal resemble tics. Certain peculiar manifestations observed in children form a connecting link between these stereoptyped movements and the true tics. To this class belongs the finger, lip, and tongue sucking, nail biting, and head shaking. There are several conditions which resemble tic, and it is often confounded with acute chorea. As a rule the differentiation is easy, though occasionally the same patient may present both affections. In chorea the movements are incoördinated and less rapid. There is uncertainty as to where the next jerk will be, whereas the movements of a tic are more or less stereotyped and are repeated at intervals in just the same order and manner. Observation of the patient usually increases the movements of chorea and diminishes those of a tic. By an effort of the will a tic can be controlled for a time. The handwriting shows this difference.

In the treatment all abnormalities near the site of the affected muscles should receive attention. Conjunctivitis should be treated, errors of refraction corrected, and adenoid vegetations removed. It should be remembered that these are only con-

tributing causes; the mental condition is always the essential factor. This is shown in those cases in which the tic suddenly disappears or is replaced by one in a different part of the body. Drugs, except tonics, are in most instances useless. Such remedies as hypodermic injections and electricity act on the mental condition, while hydrotherapy, massage, and tonics improve the general health. It is important to regulate the diet and mode of life. Mild exercise should be taken in the open air, but not to the point of exhaustion. Violent games and excitement should be avoided. In mild cases the child should be allowed to remain at school, but in more severe cases a complete change of surroundings with cessation of mental effort is indispensable.

Such general measures are useful, but they are only to be regarded as adjuvants to the treatment, which is educational. The treatment consists primarily of two parts, immobilization and active exercises. The patient is given a mirror, and the physician stands behind him, in this way demonstrating to the patient that the movement can be controlled if he wills to do so. In this way confidence is gained by ability to control the movements for a short period. At first it may be difficult, the patient not being able to restrain them for more than twenty seconds. The second part of the treatment consists of active exercises of the muscles, opening and closing the eyes, first together and then each separately. For the mouth and lips, opening and closing alone, combined with a simultaneous opening and closing of the eyes, reading aloud, and recitations or singing. For the movement of the head, flexion and extension, looking first at the floor and then at the ceiling, followed by lateral movements to right and left. For the trunk, flexion, extension and lateral movements. All movements are to be performed slowly, regularly, and at command, without jerking. At first each movement is repeated six or eight times. Respiratory exercises are also useful. The exercises should be repeated regularly and punctually three times a day. At first they should be short so as not to exhaust and discourage the patient, and be gradually increased. It is essential that the patient's interest should be excited and his attention held. For this purpose the exercises are varied from time to time and new ones added. The writer has treated ten cases with the foregoing methods, and in six the movements entirely ceased. The remaining four have been improved and are still under treatment.

Management of the Third Stage of Labor.—

BLACKER, G. F. *Lancet*, vol. clxx, No. 15 of vol. i, p. 1028, April 14, 1906.

The question as to how the placenta leaves the interior of the uterus has been much discussed. The differences of opinion on this subject are explicable by the fact that sufficient discrimination has not been exercised in studying the passage of the placenta through different sections of the uterus. It is probable that when the placenta is situated at the fundus of the uterus it is expelled inverted or by Schultz's method, but when it is attached to the anterior or posterior wall of the uterus it is expelled folded vertically or by Duncan's method. If the child's body is extracted by traction immediately after birth of the head a retroplacental hematoma is more likely to form than if the birth of the body be effected by the uterine contractions alone. After the birth of the child the fundus of the uterus is commonly at the level of the umbilicus. Ten or fifteen minutes later it has usually risen from one and one-half to two inches above the umbilicus. At this stage the uterus is well defined, regular in outline, with the upper segment flattened anteroposteriorly, while the lower uterine segment bulges distinctly above the symphysis pubis. If pressure is made upon the fundus of the uterus it is no longer possible to obtain fluctuation in the umbilical vein of the ligated cord. The absence of this sign indicates with rare exceptions that the placenta has become separated from the uterine wall. If a second ligature has been applied to the cord at the vulva it will be seen that the portion of the cord outside of the vulva has lengthened four to five inches. If there is no interference in the next ten or fifteen minutes the fundus will again descend to the level of the umbilicus, and the bulging of the lower uterine segment will have lessened. The ascent of the fundus indicates that the placenta has been separated from the upper and is lying in the lower uterine segment. When the fundus sinks again the placenta has been wholly or partly expelled from the uterus.

The termination of the third stage or the expul-

sion of the placenta from the vagina is now merely a matter of time, varying from a few minutes to one or two hours. That the placenta without any danger to the mother can be delivered by the natural forces is a fact contradicted by no one. The question naturally arises, what length of time should be allowed nature to complete this third stage without interference in the absence of complications? Winckel allows two hours to elapse, and in a large experience he has noticed no bad effects. If after that time the placenta is not expelled spontaneously Credé's method is employed. In this connection the statistics of Ziegler are instructive. In 717 of 834 cases the placenta was expelled spontaneously in 641 before the lapse of one hour, and in 76 after one hour. In 111 it was expressed by Credé's method, and in 6 it had to be removed manually. The early removal of the placenta is apt to be followed by a retention of membranes, which may be followed by septic changes, and too early removal of the placenta unqestionably favors postpartum hemorrhage.

An examination of the material in the clinic at Basle has shown that the retention of portions of the placenta and membranes was two or three times more frequent in the period when it was the custom to remove the placenta within ten minutes after delivery than it was during a later period when one-half hour or even a longer time was allowed to elapse after the termination of the second stage. It is to be remembered that if Credé's method is instituted in less than thirty minutes after the second stage it is a direct disobedience of Credé's directions. The writer is convinced that the practice of expressing the placenta within a few minutes of the birth of the child without allowing sufficient time for the normal mechanism of separation to occur is fraught with considerable danger. The retention of small portions of the placenta or membranes is one of the commonest causes of septic infection. Such retention is due not as a rule to the existence of any pathological adhesions between the placenta and the uterine wall, but most commonly to the forcible expression of the placenta before it has had time to completely separate from the uterus.

Much would be accomplished in lowering the abnormally high death-rate from puerperal septicemia if more importance was attached to not interfering too early in the third stage of labor. The correct management of the third stage should be based not upon any arbitrary rule as to the exact amount of time that should be allowed to elapse, but upon careful observation of the changes that occur in the uterus after delivery—changes which indicate with some certainty whether the placenta is separated and therefore ready to be expressed. If these changes occur in the first ten minutes after termination of the second stage of labor it is best to wait another ten minutes, unless some contraindication such as hemorrhage is present. In this way ample time is allowed for the membranes to separate. In case the signs of separation of the placenta are not present, or where their recognition is difficult, as occurs in obese patients, an attempt at expression may be made after the lapse of half an hour. If such attempts fail the placenta should not at once be removed by the hand. Manual removal of the placenta should not be practiced in the absence of any urgent condition for at least one and one-half to two hours after the birth of the child. Especially in cases of exhaustion ample time should be allowed for the placenta to separate spontaneously. At the end of from one-half to two hours further attempts may be made at expression, and if they fail manual removal should be carried out. In Ahlfeld's clinic out of 6800 labors manual removal of the placenta was required in only 53 cases. The manual removal of the placenta is attended with a relatively high morbidity and mortality.

An Operation for Cystocele.—

GRAVES, W. P. *Boston Medical and Surgical Journal*, vol. cliv, No. 17, p. 462, April 26, 1906.

The writer discusses the importance of the pubic attachments of the vagina in preventing cystocele and supporting the uterus. The operation described, an anterior colporrhaphy, depends for its success upon the presence of pubic attachments. It was first used by the writer to repair recurrent cystocele, and is now used in cases of simple cystocele and in conjunction with vaginopexy. The essential principle is an anterior denudation which takes support from the sides, but it seeks in addition to gather up all the slack tissue so as to avoid protrusions and leave the

anterior wall smooth. It is these protrusions which cause the mischief in cystocele operations, as they act like a wedge to break down the support of a repaired perineum. They also act as starting points for a new cystocele. The most important protrusion is what is somewhat loosely called urethrocele. This usually consists of a hypertrophied tab of the vaginal tissue, and in operations for perineorrhaphy should always be reduced even in cases where cystocele does not exist above it, as it is sure in time to stretch out the external portion of the repaired perineum. In performing the operation two points are selected on each side of the cystocele about one-half inch from the lateral creases, which when drawn together (Fig. 1, A to B and C to D) sufficiently reduce the cystocele and at the same time do not exert undue tension on the lateral flaps. With these four points as corners a rectangle is then denuded. A point is next selected on the urethral tab E which when drawn down to the approximated points A and B completely reduces the urethrocele. The tissues included between the points A B, E F, and G represent two deeply set dimples which are always present nearly on a level with the meatus. The deep denudation of the angles H and I is made in order to take out the slack caused by the approximation of C and D. It is not always necessary to denude these angles, and in such cases the denudation may be carried down to a point and the sides brought together, as in the oval operation. (This is shown in the figure by the dotted lines at the angle K) This form of denudation is sometimes an important procedure, for it assists in carrying backward a cervix which has a tendency to prolapse. Great care must be employed in making the incision so as to perfectly approximate the edges of the wound, thus preventing sepsis and securing union by primary intention. The wound is closed with silkworm-gut or chromicized gut sutures, except at the point where A, B, and E meet. Here a silver wire should be employed, and fixing it as shown in Fig. 2 the corners can be adjusted without cutting off their circulation.

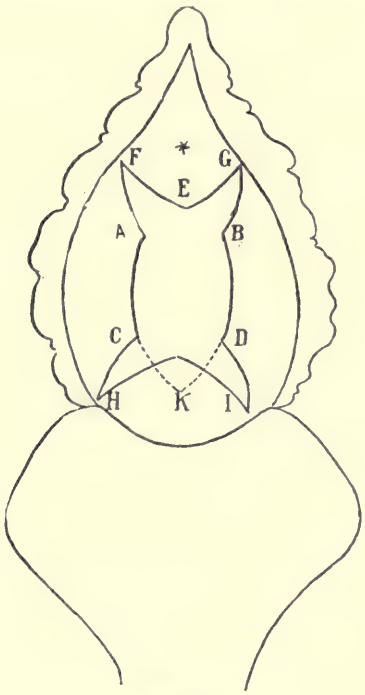

Fig. 1.

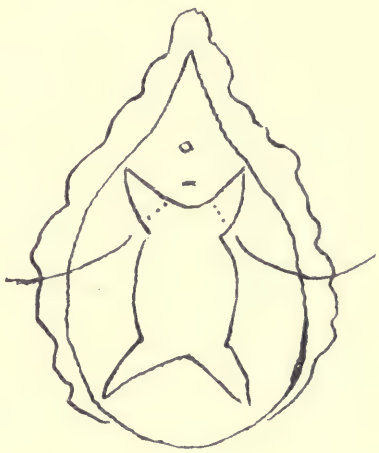

Fig. 2.

After finishing the operation for cystocele a perineorrhaphy should always be done, even in cases of recurrent cystocele in which the perineum has been previously prepared. A firm perineum should be secured, and one which will hug closely the anterior wall. Stitches from the cystocele may be removed as soon as the perineum is strong enough to stand the traction of a speculum, usually about the third or fourth week. Daily antiseptic douches should be employed, and the patient should endeavor to micturate voluntarily so as to avoid the use of the catheter.

An Analysis of 145 Cases of Typhoid Fever in Children.—

HAND, A., Jr., and GITTINGS, J. C. *Archives of Pediatrics*, 23d year, No. 6, p. 401, June, 1906.

In this analysis of 145 cases the largest number, namely 22, was found in the fifth year, and only two occurred in the first year. In attempting to estimate the prodromal symptoms difficulties were found owing to the want of intelligence of the parents or guardians. The most prominent was fever, which was present in all cases, and there was associated anorexia, headache, diarrhea, abdominal pain, drowsiness, vomiting, constipation, nosebleed, delirium, and chills, the frequency being in the order named. The majority of the cases were admitted between the fourth and eighth days of the disease. The disease was rather severe, three-fourths of the cases developing a temperature above 104°. The shortest course of the disease was eight days, while the longest was forty-six. The average duration of the fever was twenty-five days. The Widal reaction was positive in 138 of the patients. Coating of the tongue was present in 129, spots in 87, enlargement of the spleen in 95, abdominal tenderness or pain in 54. Thirty-three cases were constipated throughout the attack, and 78 became so after a diarrhea of more or less severity. Only 35 did not become constipated, and 3 of these had natural movements throughout the course of the disease. Delirium was present in 36 cases, 13 were drowsy, 11 were irritable, 2 restless, and 2 had convulsions.

In the treatment the writers believe in the importance of rest in bed, a liquid diet, coupled with hydrotherapy when the pulse and temperature call for it. Twenty-six of the patients did not have sufficient fever to need more than the daily cleansing bath. Tub baths were given to 117 patients, the great majority being kept in the tub fifteen minutes in water of 85° F. In a moderate number, depending on the reaction, the temperature was modified to 80°, 90°, 95°, or 100°. Ten patients stood the tubs poorly, and resort was then had to sponging, rubbing with ice, or the cold pack, with a mustard tub in one instance. Sponges were used in 24 patients, occasionally substituting the tubs, but more frequently sponging failed to produce the desired benefit, and the tubs were then given. Whisky was not infrequently used, but 52 patients were carried through the disease without its administration. The initial dose was governed largely by the age of the patient: 5 minims for infants, 20 minims for children under four years, one-half drachm for older children, usually given in connection with the bathing, and the amount raised or lowered in accordance with the effect produced. Ninety-three patients received whisky and 44 were given strychnine. Digitalis was given to 26 patients, mainly in emergencies.

In the discussion of this paper Abt stated that he regarded cold baths as contraindicated in children. He used warm baths, the temperature varying from 90° to 95°. Such baths were not disagreeable to the patients, and were quite as efficient as the cool baths in lowering the temperature. Where it was found that the temperature did not fall, leaving the patient in the bath ten or twelve minutes instead of the usual five or eight minutes would effect the desired reduction.

A Case of Henoch's Purpura.—

LONGLEY, J. A. N. *British Medical Journal*, No. 2363, p. 859, April 14, 1906.

This case is interesting not only because of the rarity of Henoch's purpura, but the patient was also affected with tuberculosis, and showed the value of adrenalin in cutting short the attacks and as a prophylactic agent. The patient was a delicate girl of 11, who had suffered from tuberculous lesions of the spine, hip and wrist-joints for several years. Ten days after a severe wetting an extensive purpuric rash appeared, especially marked on the legs. It was accompanied by severe pains in the joints, which were slightly edematous, and the temperature was a little raised. Two days later she was quite free from pain, and the eruption had nearly disappeared, leaving a few yellow stains. On the sixth day she complained of abdominal pain and vomited everything that was given by the mouth. At the end of twelve hours her condition seemed very grave: the face was pinched, the eyes sunken, the expression anxious, the temperature was subnormal, and the pulse quick and small. The abdomen was retracted, quite hard, and acutely tender. The symptoms were of such gravity as to suggest perforation, but the liver dulness persisted. A morphine suppository was retained and eased the pain. Later in the day vomiting recommenced,

and large clots of blood were ejected having a fecal smell. Convalescence from this attack was rapid. At intervals of about a week fresh crops of eruption came out on the legs and thighs. As this subsided the abdominal pains recommenced.

About three weeks after the first severe attack the patient had a second, which commenced with pain and swelling in the left wrist-joint. There was a papular rash on the right elbow. These symptoms disappeared in twenty-four hours, to be followed by a severe gastralgia and vomiting of blood. After some hours there was a slight improvement, and the patient was then given a mixture of adrenalin 2 minims, and 3 minims of liquor arsenicalis. This checked the vomiting and relieved the internal pains. She was kept on this mixture for three weeks, during which time she made steady progress, gaining in appetite and strength and putting on flesh. The tachycardia which was such a distressing symptom during the attacks disappeared, and the pulse became normal. One other attack which has been observed during the last six months was speedily checked by the adrenalin and arsenic.

Rheumatic Manifestations in Children.—

SICARD, M. H. *Medical Record*, vol. lxix, No. 18, p. 709, May 5, 1906.

Attention is called to the atypical symptoms of acute rheumatism in childhood. The ordinary abrupt involvement with polyarthritis and endocarditis noticed in adults is often replaced in children by chorea, tonsillitis, erythemas, subcutaneous nodules, and endocarditis, which frequently overshadow the joint involvement. The arthralgias in the rheumatism of childhood seldom present the evidence of inflammation seen in the adult. The redness, swelling, and extreme pain are absent, though there is moderate pain on motion. There is tenderness in the periarticular structures. The attacks last a few days or weeks and then subside, but show a tendency to recur. Rheumatism is rare in children under two years of age, and is still more rare in those under one year of age. In most cases of rheumatism in children of two years and over the onset is gradual, the temperature comparatively low, usually not above 102°. There is moderate pain and malaise, and examination reveals a slight puffiness or moderate swelling. The joints most often affected are the knee, ankle, elbow, or wrist, or the small joints of the foot or hand. Sometimes the symptoms are limited to one joint, and sometimes they are multiple. In some cases there is severe restlessness and pain of an indefinite character, but without true rheumatic swelling. Some cases have no fever, and the pain is so slight that the child is not kept in bed. These mild attacks may be overlooked. The temperature may be irregular, leading to the supposition of influenza or malaria, when a minute examination will reveal a sensitive joint tendon or muscle; or an endocarditis, chorea, or a persistent anemia is the first intimation of the true nature of the trouble.

Endocarditis is a more frequent complication of rheumatism in childhood than it is in the adult. Pericarditis is more important from a prognostic standpoint, but it is less frequent than disease of the endocardium. Pleurisy may occur during the course or the decline of the rheumatic attack. Not infrequently chorea is a precursor of rheumatism, and the first sequel which appears after the chorea may be endocarditis. A curious and not infrequent lesion is the subcutaneous nodules. They consist of little tumors beneath the skin, free from it, and attached by a pedicle to the tendon sheaths, ligaments, or the periosteum. They are most frequently found about the elbow-joint, tendon sheaths of the forearm and hand, the clavicle, sternomastoid muscle, the skull, the patella, the vertebral spines, and the crest of the ilium. They are usually about the size of a pea, though they may be larger, and may occur in groups, as many as fifty having been counted at one time. They are composed of fibrous tissue and may undergo degeneration and disappear in a few weeks, or may remain for months.

Erythema nodosum is the most frequent variety of erythema, though other forms may be observed. The nodes are situated mostly along the tibial regions and the extensor surfaces of the forearm. They are about three-fourths of an inch in length and have their long axes parallel to the limb, are red, raised, inflamed, and exquisitely tender. Upon fading they leave ecchymotic spots.

Tonsillitis and pharyngitis are closely associated with arterial rheumatism, and anemia, if present during the attack, is severe and often acute in its

onset. Goodhart goes so far as to say that in every anemia without cause in children the question of rheumatism should be carefully investigated. Purpura is occasionally seen as a complication, though not as often as in adults.

Fever in the New-born.—

BUTLER, W. J. *Journal of the American Medical Association*, vol. xlvi, No. 15, p. 1076, April 14, 1906.

Emphasis is laid on the importance of temperature observations during early infancy. The chances of infection in the new-born are numerous, such as contact with infectious material, traumas incident to forceps delivery, unclean surroundings, and an always possible source of infection, the navel. A series of cases of infection of the respiratory tract is described, in which the source of the infection was not demonstrable. The disease was confined to one ward in the hospital and contact transmission seemed highly probable. The symptoms were rather uniform, but not especially characteristic. The temperature was high and remittent, and there was evidence of acute rhinitis and laryngitis. In the one fatal case the child apparently died of uremic poisoning. The cases demonstrated the susceptibility of the new-born to infection of the respiratory passages, and illustrated the rapidity of conveyance and briefness of incubation in infection with the micrococcus catarrhalis and with the pneumococcus, and the contagiousness of what might ordinarily be called a cold.

Lipomatosis Universalis in an Infant Eleven Weeks Old.—

SOBEL, J. *Archives of Pediatrics*, 23d year, No. 5, p. 335, May, 1906.

The patient was the third child in a family of three children. The mother was 24 years of age and of Jewish parentage. Her second child was born at full term and appeared normal until the fourth week of life, when the mother noticed enlargement of the head and a marked accumulation of fat. The child subsequently became blind and died of bronchopneumonia, complicating what was looked upon as amaurotic idiocy. The first child of this mother is now four and one-half years of age and shows no trace of the troubles which affected her two younger children. The third child was born after a normal labor, and nothing abnormal was observed until the fifth week of life, when the mother noted a fulness of the cheeks, and warned by her experience with the other baby she consulted a physician, who advised that the baby should not be nursed so much. After this the fat began to accumulate about the neck, the chest, suprapubic and other regions. The baby became less sensitive to its surroundings, and vision apparently failed. The child nursed and slept well, and there was no cough nor convulsions. At the time the baby came under observation it presented the appearance of a miniature fat man. The cheeks were puffed and fatty, the neck short, the chin large and double, the chest and abdomen covered with fat, and the tissues of the extremities falling into folds. The head was small, with no signs of cranial tabes. The hair was soft and of usual quantity. The baby's weight was 14 pounds. There was no edema or pitting on pressure, and the glands were not enlarged. A blood count was not made, but smears stained in the ordinary way showed no apparent leucocytosis. One week after coming under observation the child died apparently from pulmonary edema.

Vaginal Drainage in Children and Young Adults.—

LEA, A. W. W. *Medical Chronicle*, vol. xi, No. 2, p. 80, May, 1906.

The value of vaginal drainage after abdominal operations is generally recognized, particularly where there is a purulent or infective peritoneal lesion. The introduction of a tube through the vagina is obviously the most efficient method of drainage, as it reaches the lowest portion of the abdominal cavity. Hitherto this method of drainage has not been advised in young patients. Pelvic abscesses in children are nearly always the result of pelvic appendicitis, and these have often been drained successfully from above, but residual abscesses filling Douglas's pouch and developing two or three weeks after the primary operation are not uncommon. It has been advised to open the abscess by the rectum, and such may be necessary in boys, but the vagina is a far better route. The writer has drained twelve cases by the vaginal route, the ages of the children varying from 5 to 14 years. In seven it was adopted for acute appendicitis, and in six for tuberculous peritonitis. All the cases of acute

B. J. C.

appendicitis recovered and remained well. Four of the cases of tuberculous peritonitis recovered and were well many months afterward. Pelvic appendicitis is the most frequent condition requiring vaginal drainage in children. In probably 30 per cent of cases of appendicitis the peritonitis extends into the pelvis and an abscess forms in the pouch of Douglas. Vaginal drainage should be carried out in acute diffuse peritonitis and in localized pelvic abscess. The advantages of the vaginal over the pelvic route is the lessened danger of infection and the facility with which the cavity can be irrigated. The vaginas of even young children can be readily dilated to the diameter of half an inch. A small retractor can be introduced, the cervix pulled down, and the cul-de-sac opened with scissors and a pair of forceps pushed into the peritoneal cavity. The presence of the drainage-tube in the vagina causes no discomfort. Usually a rubber tube is sufficient, but a glass vaginal tube may be employed. Gauze drainage is unsuitable for children.

Histological Changes in Uterine Myomata and Their Transformation into Fibroid Tumors.—

ALLEN, E. S., and CORSON, C. C. *University of Pennsylvania Medical Bulletin*, vol. xix, No. 1, p. 2, March, 1906.

The writers have availed themselves of the opportunity afforded by studying some forty uterine tumors to ascertain the transformation of myomata into fibroids. They conclude that in uterine myomata there is always a certain amount of elastic tissue either in normal amounts and relations in the blood-vessel walls or sometimes in the tumor tissue, where it is distributed among the muscle bundles along with fibrous tissue of the muscular investments. Vascular changes of the type of fibrous and elastica hyperplasias are common in such tumors, leading to the thickening of their coats, and eventual obliteration of the vessels and increase of the connective tissue framework of the tumor in the vicinity of the affected vessels. Probably as a result of nutritive disturbances brought about by such vascular changes this excess of elastica in the surrounding tissues deteriorates and eventually disappears. Probably dependent upon the same nutritive disturbances the original muscular elements of the tumor also atrophy, and finally disappear as muscle spindles, although there is some evidence that the cell wall (corresponding to the sarcolemma of the striated type of muscle) may remain and contribute in a passive manner to the fibrillar material of the final fibroid tissue. The character of the tissue and the relative paucity of fiber-forming young elements are consistent with the idea that the fibrillar tissue of the final uterine fibroid is in a large part not true fibrous connective tissue, and that the general process of transformation is not a progressive but a retrogressive one.

Antepartum Ophthalmia.—

STEPHENSON, S., and FORD, R. *The Ophthalmoscope*, vol. iv, No. 4, p. 210, April, 1906.

Cases in which babies are born with symptoms of ophthalmia have been looked upon as extremely rare. It is probable that they occur more frequently than is generally thought, as the writers have been able to find 35 recorded cases, and in their communication they give notes of 17 additional cases. The latter number includes seven in which the symptoms developed within twenty-four hours after birth, a period which is regarded as a minimum incubation period. The incubation period of gonorrheal ophthalmia is from two and a half to three days. The statement in the textbooks that it may vary from a few hours to a few days is probably due to the inclusion of antepartum infection. It indicates not a varying period of incubation, but the more widely spread occurrence of so-called congenital ophthalmia. In taking twenty-four hours as a minimum incubation period a large allowance is made for any unusually rapid action of the gonococcus in newly-born children.

By antepartum ophthalmia the writers imply an inflammatory affection of the conjunctiva produced while the fetus is still in the uterus by infection with the microörganism, the incubation period of which has completely or partially elapsed before birth. The child may be born with signs of inflammation, or the conjunctival reaction may occur at a period shorter than that accepted as an incubation period of the microörganism. An analysis of the 35 recorded cases together with the 17 observed by the writers shows that about one-half are accounted for by a premature rupture of the membranes allowing access of the microörganisms to the conjunctival sac. In the remaining cases

slight injuries to the membranes may have taken place, or infection must be assumed to have occurred with uninjured membranes. Several of the so-called congenital anomalies of the eyes, such as gonorrheal opacities, staphyloma, and microphthalmus, are probably to be explained on the theory of an intra-uterine infection.

Pernicious Vomiting of Pregnancy.—

WILLIAMS, J. W. *Bulletin of the Johns Hopkins Hospital*, vol. xvii, No. 180, p. 71, March, 1906.

The writer in an exhaustive paper discusses the general history, etiology, symptoms, and diagnosis of the pernicious vomiting of pregnancy. Careful histories of eight cases are given, in which are included a thorough study of the urine. There is an exhaustive bibliography. His conclusions are that the pernicious vomiting of pregnancy is not due to a single etiological factor and occurs as one of three varieties: (*a*) The reflex type, dependent upon the existence of abnormalities of the generative tract or ovum, which may be cured by their correction or removal. (*b*) The neurotic type, dependent upon the existence of a neurosis without demonstrable lesions, and is more or less allied to hysteria. It is the most frequent variety of serious vomiting, and can be cured by suggestion or modified rest cure. (*c*) The toxemic type is associated with characteristic changes in metabolism, and in fatal cases with lesions in the liver analogous to those observed in acute yellow atrophy. It may occur in an acute or chronic form, the former causing death in ten days or less, while the latter may persist for weeks or even months.

In reflex and neurotic vomiting there are no manifest changes in the urine, while the toxemic variety is characterized by a marked decrease in the amount of nitrogen excreted as urea and a characteristic increase in the amount excreted as ammonia, the so-called ammonia coefficient rising from three to five per cent to as high as 46 per cent in one of his cases. The toxemic type is diagnosticated by the examination of the urine, the reflex by careful bimanual examination of the genitalia, and the neurotic after the exclusion of the other two varieties. The prognosis is excellent in reflex and neurotic vomiting, providing appropriate treatment is instituted, so that the termination of pregnancy is rarely indicated. In toxemic vomiting a fatal issue can be averted only by prompt induction of abortion, and even then the prognosis is dubious.

Primary Caries of the Mastoid Process as a Cause of Mastoid Abscess in Young Children.—

GAMGEE, L. P. *Lancet*, vol. clxx, No. 18 of vol. i, p. 1236, May 5, 1906.

In young children a form of mastoid abscess occurs without the preëxistence of discharge from the external auditory meatus. Such was the character of the abscess in ten out of sixty-one cases of mastoid abscess in children under 15 years of age operated on by the writer. Of these ten cases the youngest was aged six months and the oldest seven years. There was no history of otorrhea, nor did any discharge from the auditory meatus appear during the course of the disease. There was no perforation of the membrana tympani. The abscess formed slowly in some cases, a month elapsing between the first appearance of the swelling and the first attendance of the patient at the hospital. There was a marked absence of pain. The auricle was not displaced downward and outward as in the ordinary form of mastoid abscess following suppurative otitis media. There was no elevation of temperature. There was very extensive destruction of bone, but in spite of this there were no intracranial complications.

A Case of Complete Inversion of the Uterus.—

EMANS, J. S. *Medical Record*, vol. lxix, No. 20, p. 795, May 19, 1906.

This condition occurs once in about 200,000 confinements. The patient prior to the pregnancy had worked in a tobacco factory, and also as an ironer in a laundry. Five days before delivery there was some vaginal hemorrhage, which was accompanied by irregular pains and finally by a chill, which led to delivery by forceps. Delivery was accomplished with a good deal of force. The placenta was delivered by traction on the cord and by abdominal massage of the uterus. There was a statement that soon after the delivery the uterus prolapsed, but was replaced by the attending physician. The bowels were constipated after the labor, and she was given castor oil. The fifth day after labor, while straining at stool, the uterus

prolapsed inverted. Some bleeding had taken place. With some difficulty the uterus was replaced in the vagina, but still inverted. Sixteen days after the confinement the patient was etherized and the uterus replaced.

FORENSIC MEDICINE.

Suicidal Poisoning by Lysol.—

Lancet, vol clxx, No. 12 of vol. i, p. 870, March 24, 1906.

There is imitation in crimes. The student of sociology notes a tendency for murders to occur in cycles; at one time there is an epidemic of homicidal killings connected with robberies, to be followed by a peculiarly atrocious series of wife murders. The same is true of suicide and the means that are adopted for self-destruction. In a small German village a beam between two buildings at a convenient height from the ground furnished a point of suspension for three suicidal hangings in a single week. The trustees of the village ordered the beam removed, which put a stop to this particular form of suicide. The natural explanation of these phenomena is that there are a certain number of unstable individuals in every community who are on the verge of crime or suicide, and a morbid suggestion simply precipitates an act which probably would come sooner or later. The suggestion of the means to be employed comes through the widely published accounts in the newspapers. In America there has been a steadily growing increase in the number of suicides due to carbolic acid, it having replaced the various arsenical preparations which were formerly almost exclusively used in suicidal poisoning.

A correspondent of the *Lancet* states that the German government has decided to place lysol on the list of drugs that shall only be sold on prescription of a qualified medical practitioner. Carbolic acid was long since placed on the list, and being difficult to obtain the laity naturally substituted lysol. The correspondent states that lysol has become the poison most used by would-be suicides, and the Berlin papers report almost every day a case in which some person has swallowed a quantity of the drug. Lysol is cheap and easily obtained. The frequency of attempts at suicide by this drug may be inferred from the fact that in one of the three medical clinics of Berlin no less than twenty-four cases of lysol poisoning were admitted within one year. The experience of Berlin in restricting the sale of poisons for suicidal purpose may well raise the question as to the value of such measures. It seems that the adoption of one restriction only leads the public to look for some other substance which will be "just as good"—a case of substitution in a very bad cause. One may almost question, if it were possible to prevent all would-be suicides from obtaining poison, whether it would really result in any diminution in the suicide rate. Perhaps it would only lead to an increase of suicides by drowning, shooting, or other means.

The symptoms of lysol poisoning, according to Kirchberg, is a deep stupor, which as a rule begins within a few minutes after taking the drug. Vomiting, convulsions, and diminution of the reflexes occurred only in a few instances. The sopor is accompanied by failure of the circulation, the pulse being weak and rapid, with some cardiac arrhythmia. The respiration is superficial and slow and cyanosis sometimes appears. In all patients the mucous membrane of the palate, pharynx, tongue, and lips is corroded and of a grayish-white color. In necropsies it was noted that the lining membrane of the larynx, the bronchi, and the gastrointestinal canal was corroded. Only a few patients complained of severe pains, the majority of only a slight burning in the mouth and pharynx and of pain in the stomach. The urine is of a green or black color. Bronchopneumonia is an occasional sequel, but stenosis of the esophagus does not occur as the corrosive action of the poison is superficial. If the patient survives the first grave symptoms the prognosis is relatively good. Treatment consists in evacuating the stomach; lavage should be performed until the washings have lost their opalescent appearance and the smell of lysol has disappeared. After some hours have elapsed since the taking of the poison so that a considerable quantity has probably been absorbed, calcined magnesia should be administered to produce insoluble non-absorbable combinations. The prognosis is relatively favorable. In twenty-four cases only two deaths occurred, and these reached the hospital in a hopeless state.

Poisoning by Nitrobenzol.—

GREGORY, C. H. *Lancet*, vol. clxx, No. 18 of vol. i, p. 1242, May 5, 1906.

The case reported occurred in a youth of 17 years who swallowed a mouthful of this substance from a bottle which was mistaken for one which contained lemonade. The swallowing took place about noon, and the stomach was empty. He was seen about twenty minutes afterward. Ten grains of copper sulphate was administered, but a half-hour later, vomiting not having occurred, a stomach tube was inserted, which excited profuse vomiting. An hour or two later the lips became blue. At 5 P M. the patient was in bed vomiting constantly, with the ever-present taste of the poison, and headache, faintness, and giddiness on attempting to rise. The breath and what little mucus was ejected from the stomach gave the characteristic odor of artificial oil of almonds. The pulse was weak and easily compressible, and examination of the heart showed the presence of a systolic murmur. The whole body was bluish in color, the face, especially the lips and tongue, being almost black. The following morning the patient was improved, but the headache continued for three days, and the skin did not regain its natural color for five or six days, and by that time the cardiac murmur had disappeared.

Prescriptions by Telephone.—

Journal of the Medical Society of New Jersey, vol. ii, No. 10, p. 325, April, 1906.

This most deplorable accident, a description of which is taken from the *National Druggist*, occurred in Granite City, Ill. It should act as a warning to physicians in prescribing potent drugs over the telephone. The order was telephoned by a physician in St. Louis to give a certain patient one-eighth of a grain of morphine sulphate at bedtime. The druggist was temporarily absent, and the message was received by his son, a lad of 13 or 14 years, who knew nothing of pharmacy and who misunderstood the message. The patient was given an overdose of the drug, from the effects of which he died. The coroner's jury held the doctor, the druggist, and the boy responsible for the death of the patient. In commenting upon this frightful accident the *National Druggist* says that extraordinary care should be exercised in accepting prescriptions by telephone, unless they are restricted to some simple and harmless ingredient. It is urged that all druggists should refuse to compound important prescriptions except it be with a definite understanding that the risk is assumed by those by whom the prescription is to be used.

Eucalyptus Poisoning.—

ORR, J. *British Medical Journal*, No. 2367, p. 1085, May 12, 1906.

This case of poisoning with eucalyptus oil occurred in a boy two years and nine months old, who swallowed two drachms. He was seen about fifteen minutes after swallowing the poison, and at the time was unconscious and collapsed, with a quick pulse, stertorous breathing, and pupils contracted to a pin point (the symptoms of poisoning somewhat resemble those of opium poisoning, particularly the marked contraction of the pupil). The child vomited immediately after taking the oil, and purging quickly set in. The child was given 10 grains of sulphate of zinc, which was followed by whisky. As the condition of collapse persisted strong coffee was given, the effect of which was very marked in stimulating the patient. The pupils began to dilate and consciousness quickly returned.

PUBLIC HEALTH.

The Milk Supply of Richmond.—

LEVY, E. C. *Virginia Medical Semi-Monthly*, vol. xi, No. 2, p. 32, April 27, 1906.

There is no question but the supervision of the milk supply is one of the most important functions of a board of health. Consumers have no means of ascertaining the purity and quality of the milk supplied them, and as it forms the main constituent in the diet of young children a wholesome milk supply has much to do with the mortality-rate. The ascertaining of the nutritive value of milk can scarcely be called a sanitary measure. If milk contains 11 per cent of solids instead of the required 12 per cent, it simply means that it would take 12 pints of milk to contain the nutriment that should be found in 11 pints—the purchaser is

getting eight cents' worth less of food value on each dollar's worth of milk than he is entitled to receive. It may be questioned whether the food value of milk properly falls within the domain of the public health departments. The testing of the nutritive value of milk has for so long been a custom of health departments that it may be accepted as part of their proper function. It is also of value in stimulating the dairies to keep up the standard of milk in reference to purity and cleanliness. From a public health standpoint the problem practically concerns itself with "dirty" milk. That fatal disease of cholera infantum, which is such a common disease in the second summer of an infant's life, is not due to any peculiar susceptibility of that period, but to the fact that most infants are weaned by that time and are on a diet of cow's milk. The trouble is occasioned by bacteria, which have either developed poisonous substances by their growth in the milk before it is swallowed or which work their harm by multiplying after reaching the stomach. It is impossible to obtain milk free from bacteria, but their number can be greatly diminished by care of the stables and cleanliness in milking. As a rule the bacteria introduced into milk are harmless, but if the milker happens to be affected by a contagious disease, or if the milk is stored in rooms adjoining a living room, the chance of some pathogenic bacteria being added to the milk is considerable.

Rigid inspection of all farms where milk is produced is essential, as plain, simple dirt is a greater menace than diseased cows. Cleanliness about the stable, washing the udder and right side of the cow and drying them before milking, clean hands and clean garments for the milkers, and clean pails for the milk, are among the most important means of excluding bacteria. The exclusion of bacteria is only half the battle, as warm milk may in the course of a short time develop millions of bacteria when the original contamination is slight. Measures looking to the sanitary quality of milk are of much greater value than those which aim merely at furnishing milk which is up to the standard from a nutritive standpoint. The law in Boston requires that no milk shall be offered for sale the temperature of which is above 50° F. and the bacteriological content of which is more than 500,000 per cubic centimeter. It is impossible to identify pathogenic bacilli in milk, but if the bacteria are in large numbers they may themselves be dangerous even though not strictly pathogenic, but they are far more important as indicating defects in the gathering and storing of milk. The routine determination of the bacterial content of milk is a valuable sanitary safeguard, if the results are followed up to ascertain the causes of excessive contamination.

In his conclusion the writer says that the milk supply of each city should be carefully studied and the regulations adapted for the needs of the particular place. Thus it would not be wise in a city like Richmond to adopt the same regulations that are employed in Boston. The milk of Richmond is produced on small farms near the city, and it is possible to bring the milk without cooling directly to the milk depots, where it can be cooled and stored. In Boston the remoteness of the milk supply necessitates its being transported by trains, hence the milk must be cooled as soon as it is gathered, and then must be kept cool for a much longer time and under different conditions. While prompt cooling and care of the milk is productive of much good a low temperature is no substitute for original cleanliness.

How the Fight Against Tuberculosis Now Stands.—KOCH, ROBERT. *Lancet*, vol. clxx, No. 21 of vol. i, p. 1459, May 26, 1906.

Attention is called to the fact that Koch in his original communication pointed out that tuberculosis was an infectious and an avoidable disease. At the time but little attention was paid to this doctrine, and it was a long time before old prejudices were overcome. The recognition of the tubercle bacillus placed the doctrine of the infectious nature of pulmonary tuberculosis upon a sound foundation. Its increasing recognition has led most countries to make some effort to restrict the spread of the disease. There has been a great divergence in the means employed, some relying on compulsory notification, others upon restricting its spread in cattle, while still others rely on therapeutic measures. Of late there has been a tendency to equalize these efforts and for one country to adopt what has been found efficacious in others.

Before answering the question as the best method

of restricting tuberculosis it must be definitely ascertained how the infection takes place. Only two have been seriously proposed, namely, infection from tuberculous human beings and infection through the flesh and milk of tuberculous animals. The latter can be practically dismissed, as it is so rare as to count for little in the sum total of tuberculosis. Only those who suffer from pulmonary and laryngeal tuberculosis produce the tubercle bacilli and disseminate them in a dangerous manner. It is this "open" tuberculosis which needs to be guarded against. In well ventilated and lighted rooms the danger of contact infection is minimized, but among the poor and in dark dwellings with poor ventilation the danger is very considerable. Such patients only become dangerous who are personally unclean or have become so far helpless in consequence of the far-advanced disease that they can no longer provide for the proper removal of the sputum. As a starting-point in combating all pestilence notification is of the utmost importance, and it should be introduced everywhere not only as a safeguard for the healthy but as an aid to the sick. It may, however, be restricted to patients who are unhygienically situated, and hence dangerous to those about them. It is practically impossible to house all the tuberculous in hospitals, but much good would be accomplished by taking the most dangerous—that is, those in the last stages of the disease and whose surroundings are unhygienic. This has been the experience in the isolation of leprosy in Norway, where the number afflicted with the disease has fallen from 3000 to 500 where only a small fraction of the number were segregated, but it included those that were the most dangerous.

For the past forty years there has been a decrease in the death-rate from tuberculosis, and now a very considerable proportion of those afflicted with the disease die in hospitals, and hence in the most dangerous period are placed under circumstances in which they cannot infect others. It is difficult to account for the steady fall in the tuberculous death-rate, but undoubtedly this hospital provision for the advanced and most dangerous cases has been an important influence. The treatment in a sanatorium should be one of the best weapons against tuberculosis, but the results obtained are open to considerable doubt. It is claimed that 70 per cent are cured, but as a matter of fact they are only arrested, and the patients return to their work, to later suffer from the disease and hence become a means of infecting others. The comparative fewness of the real cures in a sanatorium is due to the short duration of the treatment. The dispensary for the advanced cases that cannot be treated in a sanatorium is one of the most important means of preventing the spread of the disease. Notification, hospitals, sanatoria, and dispensaries are the most important weapons in the fight against tuberculosis. The subsidiary methods relate to instruction of the people and keeping up a lively interest in the subject. The question is after all an economic one, depending on the amount of money that can be raised to combat it. The more free beds are endowed and well conducted establishments organized, and the more adequately families of tuberculous patients are supported, the more rapidly will tuberculosis as an epidemic disease decrease.

The Contamination of Milk at the Dairy.—

STEWART, A. H. *American Medicine*, vol. i, No. 1, p. 17, April, 1906.

Milk is the most easily contaminated of all foods and is handled in a very careless manner. It frequently acts as a carrier for disease. The food value of milk is frequently destroyed by carelessness in gathering. It is a crime to send to the city milk reeking with filth from the cow stable. Ignorance in producing clean milk is just one step behind criminal carelessness. In considering the subject of an improved milk supply the initial contamination first calls for attention. The organisms that get into the milk during milking stay there longer and have the greatest opportunity to multiply and produce the acids which destroy the milk. It is the stable germs that are responsible for the early fouling of milk. The ordinary old open bucket for milking should no longer be used; the top is ten times as large as necessary and catches much floating filth. The use of a covered bucket, of which there are several kinds on the market, will do much to prevent contamination of milk. The writer has made a number of cultures from milk obtained both with closed and open buckets. The former was found to be an important element in excluding the germs. A number of different forms of buckets are described. One

which seems to be especially efficient has a spout on the side into which the milk is drawn, the body of the bucket serving as a stool for the milker. A sieve in the funnel serves as an additional protection against dirt. Before being used the buckets are sterilized in a steam-box, and after each cow is milked the funnel is removed and washed inside with running water. The cows should be milked in a milking-room separate from the stable where there will be little dust.

Sanitary Supervision of Pulmonary Tuberculosis and Other Communicable Diseases.—

BILLINGS. *Medical Record*, vol. lxix, No. 20, p. 790, May 19, 1906.

All cases of pulmonary tuberculosis, typhoid fever, and cerebrospinal meningitis occurring in the city of New York are registered at the Department of Health. An earnest effort is made to have such registration as accurate and complete as possible. Every person of those living in the house where these diseases occur is furnished instructions as to the measures to be taken to prevent their extension. The bedding used by persons suffering from these diseases is disinfected. All premises which have been occupied by persons suffering from pulmonary tuberculosis or cerebrospinal meningitis are disinfected after the patient recovers or dies. Charitable assistance or hospital care is provided as far as possible for all persons wishing or requiring it. The general public is educated as to the nature of the above diseases, the precautions to be taken against their spread, and advisability of institution and sanatorium treatment. Patients suffering from pulmonary tuberculosis with no attending physician are visited at their homes by nurses and given necessary assistance and advice. They are provided with milk and eggs when necessary, and are given free medical treatment in the department clinics. The possible source of infection in all cases of typhoid is identified where possible and suitable action is taken. In cases of cerebrospinal meningitis quarantine at their homes is enforced, and other children in the family are excluded from school. Malarial fever, abortion, puerperal fever, septicemia, erysipelas, and pneumonia are reportable diseases, but at present the patients are not visited.

Results of the Examination of Throat Cultures for Diphtheria.—

BIEHN, J. F. Biennial Report of the Department of Health of the City of Chicago, p. 35, 1906.

The writer calls attention to the fact that it is practically impossible to diagnosticate diphtheria clinically. Of 364 cases so diagnosticated as diphtheria only 135, that is 37 per cent, contained diphtheria bacilli. Four hundred and sixteen cases diagnosticated clinically as tonsillitis were found on bacteriological examination to have a little over 16 per cent of true diphtheria among them. Too much importance is apparently attached to a membrane. It is true that those without membrane are frequently cases of ordinary tonsillitis, but true diphtheria may occur without membrane just as other infections may have a membrane. Some of the most virulent cases in which a fatal result occurs within twenty four to forty-eight hours often do not present a membrane. Many cases of rhinitis are diphtheric in origin and show no membrane; they are usually diagnosed clinically as simple rhinitis, and their ending is not infrequently fatal. There is no known clinical sign or combination of signs or symptoms always present in every case of diphtheria. The bacteriologic examination should always be made, and should be repeated if the results are negative.

Experiments with Copper in the Purification of Water.—

BIEHN, J. F. Biennial Report of the Department of Health of the City of Chicago, p. 49, 1906.

Attention has recently been called to Kraemer's experiments on the disinfecting power of copper. Fluids contained in copper vessels or exposed to copper foil at 37° C. were found to be rapidly sterilized. The work of Biehn confirms the results of Kraemer, but he calls attention to the fact that the reduction in the bacteriologic content of fluids contained in copper vessels was not great at ordinary room temperature. The facilities for keeping fluids at a temperature of 37° C. would involve just as much trouble and expense as it would to boil the water. Biehn has found that typhoid bacilli exposed to copper foil are killed only after eighteen hours at ordinary room temperature. In using one quart of water he found

that at the end of twenty-four hours with six square inches of copper foil there was a reduction of 80 per cent in the bacilli; in using 12 square inches there was a reduction of 95 per cent; and with 18 square inches and twenty-four hours' exposure all of them were destroyed. While the method was especially efficacious with the typhoid and colon bacilli, with the ordinary bacteria found in tap water the copper foil did not work so well. It will not destroy the spore-bearing bacteria. The typhoid bacilli are not readily affected. The paratyphoid and Shiga bacilli are next, then colon and Asiatic cholera bacilli. The common water bacteria are very resistant. These experiments show that it is not advisable to recommend this method of purifying water to the householder. The old method of boiling water, which is of undoubted efficiency and practical utility, should remain the efficacious method for domestic purposes.

Tuberculosis a Social Disease.—

KNOPF, S. A. *Journal of the American Medical Association*, June 16, 1906.

The writer discusses the social aspects of tuberculosis and the question of its prevention by better social conditions. He does not underrate hereditary predisposition. He has seen no evidence favoring the statement that tuberculous parents confer an immunity on the children. Artificial infant feeding is one of the elements that predisposes to the disease. Children should be educated to be good and not fastidious eaters. The danger of infection in school from tuberculous schoolmates or teachers is aggravated by unsanitary school conditions and overtaxing the child. There should be more outdoor exercise. Gymnastics and swimming should be provided for in the public schools; recitations and singing are also recommended. Many children are underfed, and the providing of school luncheons would be a worthy benevolence. The baleful influence of child labor even in the home in some conditions of poverty is noticeable. The chances of acquiring tuberculosis from contact during early adult life or later may be reduced to a minimum by proper education of the subjects of the disease. Intemperance is an important element in spreading tuberculosis which should be regulated by government, and the sale of alcoholic nostrums should be prohibited, as they are more dangerous because more deceptive. Next to alcohol insanitary home conditions favor the spread of tuberculosis, and whatever will better the conditions of the poor will go a long way toward the reduction of the mortality of this disease.

State and Tuberculosis Sanatoria.—

BURNHAM, M. P. *Medical Record*, vol. lxix, No. 19, p. 746, May 12, 1906.

The writer expresses the belief that it is the business of the state to suppress tuberculosis. He analyzes the statistics of the last annual report of certain representative sanatoria. Of 1882 patients 16 per cent were discharged apparently recovered. Considering the small number of cured cases and in view of the enormous expense and the time required in treatment the state is not justified in operating sanatoria for persons in advanced stages of the disease. When the treatment is begun early the results are different. The total number of apparent recoveries among these cases is one-half. The average weekly cost of sanatorium treatment for each poor patient is about $9. The question of caring for the many advanced cases offers great difficulties, but the advisability of treating the incipient cases in sanatoria has been proved beyond a doubt.

B. J. C.

MEDICINE

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EDITORIAL.

DISCUSSION ON SYPHILIS.

The April meeting of the Hunterian Society *(British Medical Journal,* June 9, 1906) was devoted to a discussion of syphilis in its various aspects. Jonathan Hutchinson opened the discussion with a reference to the mortality of syphilis. This was stated to be 2140 in 1875, and to have fallen in 1904 to 1834. Allowing for the increase of population the figures should be 3000. Not only is the disease on the decline, but it is generally considered to be milder in type. He discussed the treatment of syphilis in the last seventy years, and came to the conclusion that mercury is *par excellence* the remedy for the disease, but that this conclusion does not deny that iodide of potassium has its uses. The indications for the two remedies have been more clearly defined. He expressed the view that the smaller doses of mercury are the most valuable, and he believes that everything which could be effected by mercury could be obtained from one grain of gray powder in pill taken with Dover's powder from three to seven times daily. He advanced the following propositions:

1. It is now almost universally acknowledged that mercury ought invariably to be given in the primary and secondary stages of syphilis.

2. The earlier it is begun the better, provided the diagnosis be certain.

3. It is possible to entirely prevent and anticipate the secondary symptoms—an opinion he had advocated for twenty-five years.

4. The suppression of the secondary stage to a large extent prevents tertiary symptoms, which are developed in the actual site of the secondary manifestations.

5. Many chancres are sufficiently characterized to justify immediate treatment.

6. As much mercury should be given as the patient can bear, avoiding diarrhea and ptyalism.

7. Continuous treatment is preferable, and should extend over at least twelve months.

8. At this stage the object is to kill the parasite. In the tertiary stage the destruction of the parasite is no longer the object of treatment. Tertiary changes are often single, very rarely indeed general, often restricted to one organ or one tissue, and there is no reason to regard them as of blood origin, whether toxic or otherwise. The parasite is in fact no longer existent.

9. Tertiary symptoms are commonest where early treatment has been delayed or inadequate.

10. There is good reason to believe that syphilis is becoming less prevalent and less severe in Britain, and that this is largely due to the wide-spread adoption of the long-continued small dose method of treatment.

11. The inunction and calomel vapor bath methods are both efficacious, but inconvenient and expensive, and apt to be prematurely discontinued.

12. Intramuscular injections are very dangerous, excepting in the hands of the expert, and should be wholly reserved for special conditions, chiefly in the army. If salivation commences it cannot be stopped, except by the excision of the portion of muscle containing the mercury.

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13. Tertiary symptoms are: (*a*) Inflammatory, (*b*) degenerative, or (*c*) gummatous. The iodide of potassium internally, and iodoform, iodol, and chinosol externally are specifics, and often produce permanent cure of gummatous growths. Degenerative changes, such as tabes, are, on the other hand, rarely arrested by specifics. All conditions attended by inflammatory changes, such as general paralysis of the insane, should be treated by small doses of mercury continued permanently. In his belief, if treatment of general paralysis be commenced in the very early stage a cure may be obtained, but small doses of mercury must be permanently continued.

14. Tuberculosis sometimes complicates tertiary syphilis. Syphilitic lupus is a combination of the two, and some "relapsed chancres" are tuberculous.

15. With reference to marriage, if the treatment has been continued for two years from the date of the chancre a man may safely marry, but a much longer period is necessary for a woman.

16. As regards inheritance, a man with tertiary symptoms may have quite healthy children. Syphilis cannot be transmitted to the third generation. The fact that younger children in syphilitic families are free from the syphilitic taint, and are well grown and robust, is opposed to the belief that the disease, when incapable of transmitting its characteristic symptoms, may yet cause arrest of development. Nor is syphilis an appreciable cause of degeneracy of the race. The Fijians, who have had syphilitic frambesia from time immemorial, are not a degenerate race.

Dr. Savage agreed that treatment has altered the character of syphilis and that gummata are comparatively infrequently observed in making post-mortem examinations. In the late manifestations of the disease tabes is common among the neurotics and general paralysis among the non-neurotic. Dr. Stewart called attention to the peculiarity with which the non-nervous tissues are affected, involvement of the nervous system so to speak being accidental. Such cases are necessarily confined to the tertiary period, but may occur at any stage even when the chancre is still present. In discussing visceral syphilis Dr. White said that our knowledge of this condition dates from the paper of Wilks in 1863. Visceral disease is much less frequently met with, due no doubt to the improvement in the treatment of syphilis. The frequency of congenital syphilis of the lungs has been very much exaggerated. Syphilis of the lungs in the acquired disease has also been much exaggerated, due to the fact that syphilitic patients are more liable to phthisis than others. Most cases of visceral syphilis are rarely diagnosticated with the exception of gummata of the liver. The discussion was continued by a number of other gentlemen, who added some curious suggestions.

WHAT IS INCIPIENT PULMONARY TUBERCULOSIS?

It is difficult to define what is meant by the term incipient as applied to the chronic infectious diseases. The older writers frequently made a diagnosis of a pretuberculous stage of phthisis, and they occasionally spoke of the symptoms being latent. What was commonly understood by these terms was that general state of impaired health with vague symptoms but with an absence of the typical signs of pulmonary invasion. At one time a diagnosis of pulmonary tuberculosis was felt to be almost equivalent to a death sentence, and it was natural for the family physician to shrink from so serious a diagnosis unless it was well founded in the physical signs presented by the patient. The results so far achieved in the treatment of tuberculosis need not cause a physician to hesitate in making the diagnosis, particularly if it is made early enough before the lung tissue is broken down and there is a secondary invasion by a mixed infection. The cry on the part of the sanitarium officer is for early cases, before the lung is extensively invaded, and long before bacilli appear in the sputum. After the lung tissue has broken down then the golden opportunity for treatment has passed.

G. W. Norris (*American Medicine,* June, 1906) says that at least eight-tenths of the patients who are sent to sanitariums are

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advanced cases. If the crusade against tuberculosis is to be advanced it is incumbent upon the general practitioner to make the diagnosis of individual cases early. It is true that advanced cases recover and some of them remain well for many years, but nothing like the proportion of these cases recover as are found in the earliest or incipient stage. It should be remembered that a patient who has been coughing for several weeks and who is raising a purulent sputum, and who has a well marked area of consolidation even if there is no cavity, is not to be regarded as in the incipient stage. It is not altogether a question of the time which has elapsed since the symptoms began, but also of the rapidity of their progress. Norris says that the most highly suggestive symptoms, and those which should always arouse suspicion, are: (1) Rapid pulse; (2) evening rise of temperature; (3) loss of weight; (4) cough. The protracted existence of any two of these symptoms should require that good cause be shown why a diagnosis of tuberculosis should not be made.

The National Association for the Study and Prevention of Tuberculosis adopted as its definition of an incipient case "a slight initial lesion in the form of infiltration limited to the apex or a small part of one lobe without tuberculous complications, and with slight or no constitutional symptoms (particularly including gastric or intestinal disturbances or rapid loss of weight), slight or no elevation of temperature or acceleration of the pulse at any time during the twenty-four hours, especially after rest. The expectoration is usually small in amount or absent. Tubercle bacilli may or may not be present." These are rather rigid requirements, and if they are to be met it will require an alertness on the part of the general practitioner in detecting these early cases much greater than has obtained in the past. If one thing more than another should be impressed upon the practitioner it is that the absence of cough and sputum does not negative the diagnosis of tuberculosis. It would be far better if the diagnosis of tuberculosis was made on suspicion, when a patient does not feel well and seems to be "run down." It would be far better that the suspicion that he has tuberculosis should be resolved in the affirmative and the patient given the benefit of the doubt. If he should be sent to a sanitarium and not have the disease no harm will be done, as the conditions which simulate tuberculosis are likely to be benefited by the open air, rest, and feeding which would obtain in such an institution. Experience has shown that such a mistake can do no possible harm to the patient, as he is less likely to contract tuberculosis in a well-equipped sanitarium than he is when exposed to the ordinary conditions of life.

THE BLOOD POISONING CLAUSE IN AN ACCIDENT INSURANCE POLICY.

A case is reported in the *Journal of the American Medical Association* of June 9, 1906, which is instructive from several standpoints. As a large number of physicians carry accident policies it should be brought to their attention the frequency with which accident insurance companies endeavor to avoid clearly stated liability. The case was passed upon by the Supreme Court of Illinois (Central Accident Insurance Company *vs.* Rembe). The policy had attached to it a slip in which it was said "to cover that class of injuries known as septic wounds caused by accident while performing any operation pertaining to the business of the insured, the poisonous matter being injected into the wound of the accident and resulting in disability or death under the conditions of the policy." The physician wounded himself in removing a cork from a bottle. On the afternoon of the same day, and again on the next day, he treated a child suffering from an abscess in the ear which was discharging pus.

On the following morning the finger began to pain him and swell, and by the second day he was suffering from a well-defined case of septicemia. Death occurred about three weeks after the accident. The insurance company refused to pay the policy, and the beneficiaries brought suit, recovering a judgment, which was affirmed.

In commenting upon these facts the court said that they established that death resulted from accidental injury to the finger. One of the clauses of the policy stated that it did not cover death resulting wholly or partially from voluntary or involuntary taking of poison or contact with poisonous substances. It was held by the court that this clause did not apply, for if the germs were a poisonous substance within the meaning of the policy those germs according to the testimony would have produced no injurious effect but for the wound in the finger. They only became poisonous when allowed to mingle with the blood. The insurance company further contended that the policy only covered cases in which the surgeon was actually engaged in operating on or administering treatment; that the operation of opening the bottle did not come within this clause. The court held that this was too narrow a construction of the language of the policy. In discussing these problems the court says: "Suppose the insured cut his finger by accident while preparing instruments with which to perform a surgical operation, or if after the operation in disinfecting the instruments used he had accidentally wounded himself and blood poison had in either case supervened, would it be claimed there was no right of recovery under the conditions of this policy?" The clause read "caused by accident while performing any operation pertaining to the business of the insured." His treatment of the patient was a continued service and should not be limited to any particular act in such treatment. The preparation of medicine to be taken internally at the very time the patient was in his office or subsequently according to directions was, the court thinks, administering treatment pertaining to the business of the insured within the meaning of this clause.

The whole litigation is an example of how fine-spun distinctions may be woven into a specious argument to defeat a clearly worded contract. It should prove a warning to physicians to be on their guard in accepting accident policies which contain a clause insuring against blood poisoning.

A PHYSICIAN AND STATESMAN.

It is so rare that others than lawyers attain distinction in public life in this country that it is refreshing to learn of some instances in which medical men have achieved signal distinction in public life. There is no country in which the legal profession occupies such a preponderating position in public life as it does in this. It may almost be said that this is a government of lawyers, for lawyers, and by lawyers. In some way there is a belief that there is something in a legal education that peculiarly qualifies a man for the business of administration. Just why this is so we are unable to say. It is certain that business men and other professions are but poorly represented in the Congress and our State legislatures. It would certainly be vastly to the benefit of the community if a larger number of physicians represented the people in legislative bodies. Some years ago we looked up the proportion of lawyers and physicians in the parliament of France, and found that the number of physicians exceeded the number of lawyers. The leading statesman in France to-day is a physician, though such is not generally known. Dr. Georges Clemenceau, spoken of as the Warwick of France, and easily the leading statesman in that country, is a physician who at one time practiced in New York.

If it had not been for the Franco-Prussian war he would probably have remained in this country and have become a leading American physician, though perhaps he would never have reached any distinction in political life. He is now 66 years old. He was an interne in the Paris hospitals, and at 22 he wrote a work on "Anatomic Conceptions and General Physiology." He opposed Louis Napoleon and the establishment of the second empire, and was invited to leave France, going to New York, where he entered the practice of his profession. Three years later the Franco-Prussian war overthrew the empire, and he returned to France to take up that brilliant political career which has finally culminated in his becoming the leading statesman in France.

PSEUDORENAL DROPSY IN A CHILD.

Generalized edema in children without obvious cause is a rarity, but it is occasionally seen. Such a case was recently reported in the *Lancet* of June 23, 1906, taken from the service of Samuel West, of St. Bartholomew's Hospital. The child was 20 months old, suffering from a generalized edema. The abdomen was distended with gas and free from fluid. The liver was enlarged, but all the other organs healthy. The history obtained was that the child had been in good health until a severe attack of measles a month before admission. This had been followed by frequent and severe diarrhea. Ten days before admission the swelling of the face and body began and soon reached a considerable degree. There were no other symptoms and no gastric disturbance. In a week the edema had completely disappeared from the legs and body, and in a few days more from the face. The blood was examined and showed a slight leucocytosis, but the red blood cells numbered four million. The examination of the urine was negative. In discussing the features of this case West calls attention to a condition which while by no means rare seems to have escaped mention in the text-books. Profoundly cachectic infants may suffer from edema, but it usually occurs in the dependent portions of the body; this differs from that noted in the present case, which was comparable with that met with in acute nephritis, the edema having the same distribution. No similar conditions seem to occur in adults. These edemas sometimes disappear, to return again as the child gains or loses in strength.

IMPORTANCE OF THE PSYCHIATRIC CLINIC.

Experience shows that when a clinic is especially devoted to one particular branch the subject is likely to be pursued with a precision not attainable in a general clinic. Significant examples of intensive methods applied to the clinical field are the late development of tuberculosis dispensaries and the clinic for infectious skin diseases of Sabouraud in Paris. For years both infectious skin diseases and tuberculosis have been going one to the dermatological clinic and the other to that of internal medicine, without any marked improvement in the management of these cases. When separated from the mass of other patients not only was there a marked gain in the clinical histories, but especially from the standpoint of therapeutics. In modern psychiatry there is a curious dislocation between the early and late cases of mental disorders. The staff of insane hospitals study mental diseases when the disorder has advanced so far as to interrupt the social relations and make it necessary to subject the individual to some restraint. The result is that the resident physicians of asylums have but a limited acquaintance with the incipient stages of many mental disorders. In the general neurological clinic they are very apt to be neglected for the apparently more fascinating organic disorders.

So far as we know there is but one exclusive

psychiatric clinic in the United States. Fortunately for the symmetrical development of medical science there has of late years been an increasing recognition of the importance of psychiatric research. The cruder efforts of the hypnotists are gradually yielding to more exact research both in the line of normal and abnormal psychology, and this has resulted in placing a large share of the so-called neurasthenics in a group of purely mental diseases, and in addition it has been found that mental changes are not infrequently associated with many other diseases. If the medical man of the future is to become posted in this line of work it will be necessary for medical schools to have psychiatric clinics. That they should form a separate department of the ordinary clinic is perhaps unnecessary, but if they are to be well taught such a department is essential. Every city of considerable size should have a detention hospital for mental cases, and it is needless to say that they should be under competent professional control, being removed from the usual political atmosphere surrounding such institutions. Every large hospital should have wards for psychiatric cases. While it is necessary for them to be under the care of specialists in this line, it is not well to separate them too far from general medicine.

INFLUENZAL MEMBRANOUS URETHRITIS.

Not long since it was practically believed that there were no blennorrheas of non-specific origin. The recognition of the gonococcus placed the pathology of urethral inflammations upon a substantial basis, and it was soon recognized that many urethral inflammations were due to other causes. A. W. Myers (*Wisconsin Medical Journal*, June, 1906) says that membranous urethritis is a condition so rarely seen that text-books do not even mention its existence. Others speak of it as being present in chronic gonorrhea, but its occurrence as an acute condition has been overlooked. Cases have been reported following the use of strong chemical solutions in the urethra, but so far as the writer is aware no case of urethritis of influenzal origin has been reported, though he sees no reason why it should not occur, particularly in severe inflammations where there is extravasation of blood, cellular infiltration, and thrombosis of the superficial vessels. His first case occurred in a man of 25, with no history of gonorrheal infection. He was seen during a typical attack of influenza of a mild type, and at the end of four or five days he returned to his work and developed frequent urination with burning pain in the perineum. These symptoms increased in severity, but there was no urethral discharge. A few days later he passed a membranous cast of the urethra about one and one-half inches long. The urine contained numerous shreds and filaments, but stained smears did not show gonococci or influenza bacilli. After the passage of the cast the pain and dysuria rapidly subsided, the urine clearing up in about two weeks. At no time was there a urethral discharge, and no gonococci were found, although search was repeatedly made.

Another case occurred in a boy 16 years of age, of previous good health. His sickness began with pain in the rectum and urethra. The evening of the same day his temperature was 105.2°. On the following day there was little pain, but the fever was still high and there was general muscular soreness and a slight coryza. On the third day there was intense pain along the urethra. The urine contained membranous flakes, and later a cast of the urethra was passed. The turbidity of the urine cleared up in a little over a week. There was no urethral discharge. The urinary sediment consisted of leucocytes and squamous epithelial cells, and it was repeatedly examined for gonococci, but none were found. An attempt was made to demonstrate the influenza

bacillus in the membrane, but it could not be identified.

While the influenza bacillus was not demonstrated in these two cases, it seems probable that that was the origin of the trouble, as the symptoms were associated with what appeared to be a typical attack of this disease. It is certain that the cases reported differed in their clinical histories from ordinary gonorrhea, as the gonococcus was carefully searched for and not found.

THE INTERNATIONAL MEDICAL CONGRESS.

The recent gathering at Lisbon emphasized the "picnic" character of late congresses. So far as the reports go no discovery was announced—indeed, no important paper was read. A vast programme was prepared, less than one-fourth of which was read, while nearly one-half of the papers were not offered by title, the authors not being present when the papers were called.

The International Medical Congress seems to have degenerated into a show for the exhibition of uniforms, university gowns, and to furnish a stage where men may exploit themselves if they have the price. It looks so well to see an announcement in the home paper that Dr. Blank has gone to Lisbon to read a paper before the International Medical Congress. This gratifies the self-esteem of Dr. B., and possibly he may be prompted thereby to improve his work and live up to the new honors into which he has pushed himself. The most that can be said is that international congresses are harmless, as the medical profession for the last few years has ceased to take them seriously.

The work of the sections has been steadily deteriorating, and at Lisbon seems to have reached the limit of uselessness. The best sections, according to the published reports, were those on Medicine and Hygiene. In the other sections the attendance was so poor that in many instances the reader had for his sole audience the officers of the sections. When an audience did gather the general conduct was similar to that of a *conversazione,* and in the babel of tongues the words of the essayist were lost.

From a scientific standpoint the future of congresses does not appear bright. The next one will be held in Budapest in 1909. As a pageant and picnic it will be a grand success. Every one who wishes to have a good time should go, and by all means get your name on the programme early—but don't worry about preparing the paper; it won't be needed.

HEALTH OF THE JAPANESE ARMY AND NAVY.

The collapse of the commissary and medical departments in the Spanish-American war taught this country that the medical department of an army should be composed largely of hygienists and internists rather than surgeons. How far we have acted upon this information remains to be seen, but it is a lesson which the Japanese learned early, and in their striking capacity for details carried out with a precision that has never been equaled in any military campaign. For years before the breaking out of the Russian war they had been profound students of military and naval hygiene, and they realized that an effective army and navy depended upon the health of its individual units. A soldier to be effective in the field must be strong and healthy, and anything that impaired the physical vitality of the soldiers and sailors so far decreased their fighting efficiency. To those who would learn how this is brought about we would refer to the lectures delivered at St. Thomas Hospital on May 7, 9, and 11, 1906, by Baron Takaki, late director-general of the medical department of the imperial Japanese navy. The story is com-

paratively simple. It relates to the hygienic care of the individual and deals with a multitude of little things, such as the care of the soldiers' feet; the avoidance of slight wounds, and the care of them if they occur; the clothing and also the diet, the latter two items being of vast importance from the standpoint of efficiency.

THE AMERICAN MEDICAL EDITORS' MEETING.

Thirty-seven years ago this society was formed, but for many years the numbers who gathered at the annual meeting were small. The spirit that animated them was always fraternal. It is difficult to estimate the influence that this association has had in keeping alive the *esprit de corps* among medical editors and in elevating medical journalism. The last session held in Boston was eminently the most successful in the history of the association. A number of excellent papers were read dealing with topics of interest to medical editors, the meeting closing with a banquet at which covers were laid for 75. The retiring president is Henry Waldo Coe, of Portland, who was succeeded by James Evelyn Pilcher.

THE INFECTIOUS NATURE OF INFLUENZA ACCORDING TO BENJAMIN FRANKLIN.

On April 20 the American Philosophical Society commemorated the 200th anniversary of Benjamin Franklin. Charles W. Eliot delivered the address on that occasion, discussing the many-sided character of Franklin's communications in the domain of science. It will certainly be interesting to this generation to learn that Franklin maintained that influenzas which were usually classed as colds do not arise as a rule from either cold or dampness. He pointed out that savages and sailors who are often wet do not catch cold, and that the disease called a cold is not taken by swimming. He maintained that those who live in the forest and open barns or with open windows do not catch cold, and the disease called a cold is generally due to impure air, lack of exercise, or overeating. He distinctly formulated the conclusion that influenzas and colds were contagious. Considering the state of medical knowledge in his time it is remarkable that he should have used these words: "I have long been satisfied from observation that besides the general colds now termed influenza, which may possibly spread by contagion as well as by a particular quality of the air, people often catch cold from one another when shut up together in close rooms and coaches, and when sitting near and conversing so as to breathe in each other's transpiration; the disorder being in a certain state."

EXPERIMENTAL IMMUNITY—VACCINATION AGAINST TUBERCULOSIS.

Whether there is an acquired immunity to tuberculosis is still an unsettled question. Some of the ablest students of tuberculosis believe that there is, but all of them express themselves conservatively, believing that the evidence is rather in accord with the general theory of infectious disorders rather than any experimental demonstration of acquired immunity. Recently Calmette and Guerin in a report to the Paris Academy of Medicine claim to have obtained an experimental immunity to tuberculosis in animals. This was obtained by feeding the animals with bacilli that had been destroyed by heat, or whose infectivity had been diminished by other means. It was found that calves which were given two quite large doses of dead bacilli at intervals of forty-five days were found to confer an immunity for at least four months. How much longer such immunity may exist will require further investigation. It is stated that this method of vaccination may prove successful in the human being.

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ORIGINAL ARTICLES.

ON THE BOTANICAL DIAGNOSIS OF LEPTOTHRIX RACEMOSA AND ITS RELATIONS TO THE MODERN DOCTRINE OF BACTERIOLOGY.*

BY FILANDRO VICENTINI, M.D., CHIETI, ITALY.

I am heartily obliged to the committee for the hospitality kindly granted to the present communication, by which I hope to call the attention of all the medical profession to the subject.

How I was led to the discovery of this new organism through my daily examination of sputa for clinical purposes has been already pointed out, first in my work on "Bacteria of the Sputa and Cryptogamic Flora of the Mouth," and afterward in my reply to Professor Arkovy (see literature at the end of paper, 13 and 34).

"The discovery of the new organism must be regarded as the most important in the entire history of the bacteriology of the human mouth, and one which I believe is destined profoundly to modify our entire conception of this whole subject."

"I regard it as greatly to the discredit of the scientific world that Dr. Vicentini's work should have been so completely ignored." (Dr. Leon Williams.)

The quoted work has been originally addressed to medical men working with the microscope rather than to the professional bacteriologist. The numberless bacterial elements shed by *Leptothrix racemosa* into the mouth thrive indeed in this cavity, and spread thence through the digestive, genito-urinary, and air passages; but owing to the fact that the parent organism by which the said bacterial elements are set free reaches its full development on the teeth in the shape of a dense felt, bearing on its upper layer countless fruitful heads, paraphyses, and male organs, it so happened that a number of teachers of bacteriology in dental schools, as Mr. Mummery, Professor Miller, Dr. Leon Williams, Dr. Watson, Dr. Blue, Dr. Mendel-Joseph, and others, were particularly engaged in the practical verification of the existence and morphologic characters of the said organism. I am above all indebted to Dr. Williams for his valuable contribution and very beautiful photographs, by which, as said Dr. Mendel-Joseph, of Paris, "he rendered great service to the discoverer, and the new organism emerged from the confined atmosphere surrounding it."[43]

But the subject appears, on the other hand, so intimately connected with medical and chirurgical pathology that I dare invite the attention of all our professional brethren to it, the conception of the botanical independence of bacteria as simple "monocellular organisms" being still held in modern treatises on the flora of the mouth, and the great majority of the physicians having been taught to consider the dissevered bacterial elements, thriving in our economy or in artificial culture media, as so many independent beings, without any suspicion that they could be, on the contrary, single, scattered particles of more complex ones.

Now that the bacteria of the mouth, though endowed with a power of multiplication by fission, are not true and complete "organisms," but rather "simple scattered particles" of a more complex organism, *Leptothrix racemosa*, is the prominent fact brought into view by my

*Read before the American Medical Association, Section on Stomatology, Boston, June 5 to 8, 1906.

humble work, which, according to Dr. Williams, will profoundly modify our entire conception of the whole subject.

In 1890 I delivered before the Royal Medical Academy of Naples my second communication on bacteria of the sputa in which was noticed the discovery of racemosa. It happened that Professor Klein presented to the Royal Society of London photographs of a culture of the tubercle bacillus showing distinct branches like a mycelial fungus, from which he inferred that at least a few schizophytes are really forms of development or "passing phases" of superior organisms (see page 141 of my work). Since then, not only was the same fact confirmed in old cultures of tubercle bacillus by Fischel, Coppen-Jones, Bruns, Semmer, Babes, and Levaditi, but a nisus toward an analogous development was noticed also in diphtheria bacillus by Kanthack and Fraenkel, in *Spirillum undulaminus* and *Vibrio rugula* by Kutscher and Zetnow, and in another undetermined bacillus by Stoltz. To which it may be added that even pneumococcus, bac. anthracis, bac. subtilis, spirillus choleræ, streptococcus, etc., may show likewise a morphologic evolution toward higher forms, and that both the diphtheria bacillus and tubercle bacillus are now conjectured by many observers to be nothing but a life phase of some cladothrix or streptothrix species,[40] or according to Dr. Williams, "a degenerate phase of mycelial fungi."

But although the true meaning of the said branching forms had been already pointed out by Professor Klein, the facts alluded to came to light so unexpectedly and so little in accordance with the doctrine of the monocellular nature of bacteria, that they were overlooked by many observers, or related by others, for instance by Professor Gunther, to "involution forms" rather than to an "evolution process."

Now the suggestion advanced by Professor Gunther appears in flagrant opposition to that of Dr. Williams and others, who were inclined to refer the said rudimental bacilli to a degenerate phase either of mycelial fungi or of higher bacteriaceæ, while Professor Gunther would hold the reverse—*i.e.*, the branching forms as a degenerate phase of the single bacilli. Along this line one could claim for argument's sake that the most complex bacterial growth within our acquaintance, racemosa, may be nothing but a jumbling of analogous involution forms; but to any unprejudiced mind it will be made quite evident that the branching forms above mentioned depend, on the contrary, on some power of complex growth more or less analogous to that of racemosa, given and not conceded that the said bacteria would be in themselves so many adventitious microbes coming one by one from without rather than, as it seems more probable to me, simple scattered particles of racemosa. In both cases their life history could not be further confined within a merely monocellular and dissevered condition, and consequently their laboratory habit could not be further maintained as a distinctive criterion for their botanical diagnosis. Until, indeed, the single scattered elements formed in the normal or morbid seats or products of the body were credited as so many independent beings to an amount of fifteen hundred forms, classified as quite different species of microorganisms and nursed as such in artificial culture media, the assumption that many of these asserted species (a daily increasing flora of so-called pathogenic bacteria) had been created by design to destroy human life, by engendering each of them, this or that particular disease, could be allowed without apparent difficulty. But the conception of the "botanical entity" of bacteria being once modified in the direction above suggested, and many of them being once acknowledged as passing phases of some parent organism, neither the morphologic and staining appearances of their particles nor the behavior upon this or that culture medium or the asserted pathogenic power of the particles

themselves could further assist us for an exact determination of their species.

Of what consequence all this may be in connection with the life history of racemosa and with the modern doctrine of bacteriology we shall see perhaps more particularly in a further communication. For the moment I hope that the short account here premised will be a sufficient stimulus to our colleagues to personally verify the various appurtenances and life stages of the new organism.

I was censured, in the meantime, for having, it was said, indulged more in theoretic discussion than in a clear morphologic exposition; but all the morphologic characters of the new organism had been already "minutely described" in my work, as said Dr. Williams. In the subsequent papers, while I was obliged to deal with the objections and difficulties advanced by the critics—that, for instance, my researches did not center above the ritual culture methods, that my work represented therefore an "anachronism," and so on—I did not forbear, on the other hand, from claiming "a practical verification of the facts alleged by me," a point on which I am pleased now to find in Dr. Mendel-Joseph the following: "The book, published in 1890, treating for the first time of Racemosa, raises a discussion as to the proper nature of the discovery, especially with regard to the doctrine professed by the author. In an article in the *Cosmos* Vicentini gives telling bibliographic evidence. But this is properly speaking only a literary dissertation of which Vicentini complains, and justly so; instead of fruitless discussion, it is preferable to give facts and either a positive or negative proof. We must admit that the choice is not easy, as we should remember that in 1899 Williams called the attention of the profession to the existence of a new organism, which at once took the first place among the representatives of the buccal flora."

At any rate, as the English edition of my work is "out of print" I will give as briefly as possible a morphologic sketch of the organism, referring the reader for clearness to the accompanying plate and to Dr. Williams's photograph.

"That hundreds, I might say thousands, of expert bacteriologists," wrote Dr. Williams,[24] "should have worked for years at these problems without discovering this important organism is, I have no doubt, entirely due to the fact that nearly all bacteriologic specimens are mounted in balsam, a method almost certain to destroy these fructification heads." But I showed in my replies to Dr. Williams[26] and Mr. Mummery[30] that the carelessness in collecting the "patina denturia" by scraping it too deeply, and the excessive trituration of the specimens upon the slide to the effect of dissociating as far as possible the various particles credited as so many independent beings, were the sufficient causes for which, in the hands of the previous observers, the fruitful heads of racemosa were systematically, though unintentionally, destroyed. Dr. Mendel-Joseph has recently expressed himself in the same sense by saying: "Indeed, it is not as Williams would have it that on account of the custom of studying specimens in balsam of Canada the organism of Vicentini remained long undiscovered, but because the current methods tend to destroy the delicate structure of the fructification heads."[43]

The *patina denturia* (white deposit on the teeth, *materies alba* of Leeuwenhoek) appears indeed to be composed of two distinct layers—*i.e.*, (*A*) the upper layer, embracing the tufts or aerial-like appurtenances of the growth, and (*B*) the deep or lower layer lying in immediate contact with the tooth. Both these layers had been, however, previously described as an assemblage of barren filaments and granules, under the name *Leptothrix buccalis*, by Robin, who considered the whole growth as a filamentous alga. But the very complex life his-

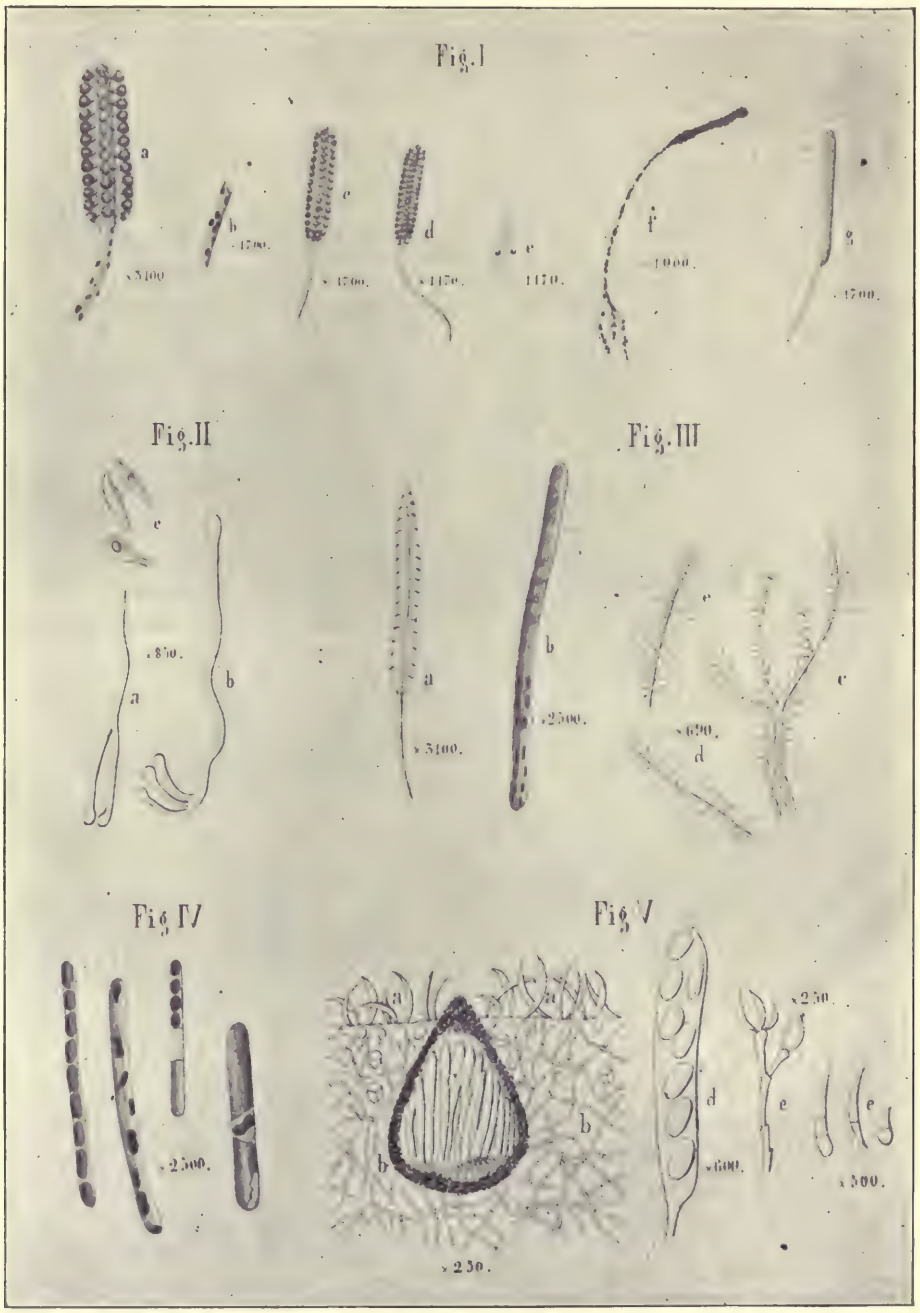

FIG. I.—(*a*) Fruitful head showing the involving glair, the pedicles, the stem, and the reserve gemmules. Weak gentian-violet, x 3100. (*b*) Fragment of stem with reserve gemmules Fuchsin balsam mount, x 1700. (*c*) Fruitful head. Iodine solution, x 1700. (*d*) Fruitful head Same stain, x 1170. (*e*) Fragment of stem with pedicles spoiled of their sporules, excepting two sporules still adhering. Same stain, x 1170. (*f*) Fructification of racemosa with three roots. Gentian-violet, balsam mount. From Dr. Williams's photograph, x 1000. (*g*) Club-shaped stem. Gentian-violet, x 1700

FIG. II.—(*a*) Fragment of a younger filament (paraphyte?) with two roots ending in small swellings like haustoria. Natural state, x 850. (*b*) An analogous unbroken filament with three roots. Natural state, x 850. (*c*) Swellings at the apex of other analogous filaments. Gentian-violet, x 850

FIG. III.—(*a*) Sheath expansion (young antherid or spermogone?), continuing fine transverse beams. Strong gentian-violet, x 3100. (*b*) The same, fallen unripe from the stem Same stain, x 2500. (*c*) Branched pseudo-inflorescence (male organ?). Natural state, x 690. (*d*, *e*) Isolated pseudo-inflorescence. *Id.*, *Id.*

FIG. IV.—Dissevered articulations of lowered stumps with enclosed bacteria. Gentian-violet, x 2500.

FIG. V.—Chrysogluten Biasolettianum. (*a*) Conids projecting upwards. Schematical, x 250. (*b*) Thallus, *Id.*, *Id.* (*c*) Apothece with asci, *Id.*, *Id.* (*d*) A single theca with eight spores. *Id.*, x 600. (*e*) Stem-bearing conids, *Id.*, x 250. Conids set free, *Id.*, x 500.

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tory of the same growth, its unexpected fructification method, as well as its close relationship to the dissevered bacterial elements of the mouth, led me to change the original term adopted by Robin to that of *Leptothrix racemosa.*

(*A*) The upper layer of the said growth embraces the following appurtenances:

1. A number of fruitful heads, resembling very minute pedicillar fungi, thriving in an amount of nearly a trillion and six hundred billions on the whole human denture. To acquire an approximate idea of their profusion, it will suffice to glance at Fig. 17 of Dr. Williams,[24] or at Fig. 58 of Mr. Goadby,[39] where, on a smaller space than the point of the finest needle, a front view of no less than sixty fruitful heads may be seen, and a square number of three thousand and six hundred fructifications be calculated.

As the fruitful heads thrive in the upper layer of the *patina denturia,* they must be obtained by scaling the patina as slightly and superficially as possible by a bent needle without abrading the deep layer and avoiding any subsequent trituration of the specimen. The specimen should be taken in the morning, fasting, preferably in subjects who are not in the habit of using tooth-brushes or powders. In unstained specimens the fruitful heads, under a medium power, exhibit a granular or mulberry appearance. Stained with gentian-violet-anilin water, they may be examined under a 2-mm. apochromatic cedar oil, object-glass, or more suitably under a 1/25 achromatic, vaselin oil-immersion like that I described in my work. Staining with iodated iodide of potassium and lactic acid gives the best images under the above 1/25 lens for the demonstration of the pedicles or sterigmata, though the specimens stained by this method do not support well the deep oculars beyond a No. 1 or 2 Huygenian eyepiece, while the 2-mm. apochromatic lens seemed to me comparatively less suitable for showing the pedicles under the iodine stain.

The single elements of the racemosa fruitful heads are in their turn five in number, as follows:

(*a*) The central stem, generally slender, pale (Fig. 1, *a*), containing internal parietal gemmules, invisible in iodine solution but very distinctly observable under gentian-violet. I have since found by chance, in some specimens of pneumonitic sputum stained with fuchsin and mounted in balsam, the best evidences of the said gemmules, which appear sometimes crowded here and there within some scattered fragments of the stems (Fig. 1, *b*). In my replies to Dr. Williams[25] and Professor Frey[42] I showed that these small globular particles within the fruitful stem cannot be regarded as "future sporules," as seemed to Dr. Williams, because they may be perceived as well within the matured stem, already "spoiled of their sporules," so that they might be considered rather as "persistent particles" having some further office to fulfil, like a reserve staff, by their subsequent development into enclosed bacteria within the old truncated stalks, as we shall see later.

(*b*) To the central stem follow, in the order of development, the pedicles or sterigmata destined to bear the sporules. They are very slender and pale, invisible under common object-glasses. The apochromatics may supply very distinct images of such pedicles by the aid of photography,* but direct observations do not answer likewise, and thus it happened that various observers could not succeed in perceiving in this way the sterigmata in question.

The best specimens for direct observation may be gathered by scaling lightly the labial surface of the tooth (preferably one of the superior cuspids) neatly from top to bottom,

*Especially with the ultra-violet.—V. A. Latham.

in order not to spoil the fructification, and carrying the very minute particle of the patina on to the slide and scaling afterward in the same manner the interstice between the teeth for placing another similar particle on the slide, avoiding as far as possible the abrasion of the lower layer. The bulk of each particle should be no more than half a millimeter, and the distance between the two nearly three millimeters. Then a drop of lactic acid is to be added, and both the particles must be gently spread on the slide by the aid of the needle so as to reduce the whole specimen to a kind of whitish dust over an area nearly the third of the space to be covered. The single particles of this dust consist of as many minute clods of the growth with scattered elements and isolated fruitful heads floating around the specimen, or through the interspaces between the clods. The specimen is then stained with one or two droplets of a five-per-cent watery solution of iodated iodide of potash, rather than with tincture of iodine, as was doubted by some observers, and as soon as the tint of the clods turns sufficiently yellowish the cover is applied, avoiding air bubbles, and the specimen left to partly evaporate under a glass shade, in order to prevent the subsequent wave of the fluid in pressing down the cover, or the use of blotting-paper, by which many of the isolated fruitful heads would be drawn off.

The specimen being meanwhile too thick needs to be reduced, after a certain time, to the thinness and transparency required for examination, by pressing down the cover as slowly and gradually as possible, in order to avoid any overflowing, both of the fluid and of the material, and to reduce lastly the whole specimen to a very thin, transparent film, approaching nearly the edges of the cover. Under the above 1/25 immersion lens and a No. 1 Huygenian eyepiece, the search for "isolated fruitful heads" should be preferably directed toward the edges of the preparation or through the interspaces between the clods, where by their lightness the said isolated exemplars are usually impelled, inasmuch as it is precisely upon such isolated fructifications, especially when they are still unripe and "with less crowded sporules," that the pedicles in question may be more distinctly perceived and a so-called "critical image" of the same may be secured (Fig. 1, *c, d*), magnified more than under a No. 1 eyepiece for delineating the pedicles more distinctly.

No doubt in the above specimen hundreds of fruitful heads will be present, but notwithstanding it may happen that none of them give the critical image desired. Then the attempt should be repeated with another specimen.

It was objected by Mr. Goadby that "if the spores are attached with these pedicles to the central stem, one would expect to observe the pedicles spoiled of their sporules on parts of the stem." But an example of this kind had been already noticed and drawn by me (see Fig. 1, *e,* where the pedicles appear spoiled of their sporules, excepting two sporules, still adhering). Only I will note in passing that the attenuated diameter of this fragment of stalk probably depended upon the escape of its sap and the consequent shrinkage of the sheath.

No wonder that Dr. Mendel-Joseph did not succeed in perceiving the pedicles under a Leitz 1/12 homogeneous immersion and a No. 6 ocular, because the said object-glass does not exceed an initial power of 76 diameters. I myself could not detect them under a 1/18 immersion lens. It seems that none of the said object-glasses can give an image of the repeated pedicles, owing to the extreme tenuity and transparency of the latter near their point of attachment. Neither could the relatively low power of the object-glass be increased in this case by the eyepiece, because the latter does not magnify the object but simply increases the size of the image of the object formed by

the object-glass. I may recall the fact that it was only under an initial power of 180 diameters that I could succeed in detecting directly the pedicles in question.

Professor Miller, before the Fourth International Dental Congress (Section 11, Sept. 1, 1904), in dealing with the subject opportunely discarded the doubt advanced by Dr. Hurst that the grouping of the sporules around the central stem could represent a simple phenomenon of chemiotaxis. But in dealing with the pedicles Professor Miller made use of the term "thorns," which I may remark might be mistaken for "spines" or protrusions pointed at their distal end, while the pedicles in question are, on the contrary, funnel-shaped—*i.e.,* beginning from a fine point implanted on the stem and ending at the distal extremity by a kind of expanded cup which bears the respective sporules.

Opportunely likewise Dr. Mendel-Joseph discarded the objection advanced by Mr. Goadby that the pedicles in question might be artefacts. "The apparent lack of knowledge of evident facts is surprising on the part of a bacteriologist so distinguished and experienced."

(*c*) The sporules constitute the third element and are of globular form, pale in iodine solution, more or less colored in anilin. They are implanted on the respective pedicles around the central stem in six longitudinal rows. Dr. Williams, however, gave photographs of twelve more rows. "I think, with Vicentini," says Dr. Mendel-Joseph, "that in typical non-hypertrophic forms the number of rows does not exceed six, but they increase in number by proliferation of the spore element."[43]

Now the explanation advanced by the French author would be invalidated by the fact that each spore arises directly from its own pedicle. I am inclined rather to believe that the number of the rows may effectively increase according to the diameter of the central stem. Some of the said stems are in fact club-shaped (a particular I have omitted under the heading (*a*) for brevity's sake), and we may plainly understand that around these clubs with a larger circumference (Fig. 1, *g*) there may be room enough for a greater number of rows. Apart from this explanation we have to consider whether some of the cross or transverse sections photographed by Dr. Williams were caught foreshortened—*i.e.,* in an oblique section rather than in the normal one—and on the other hand whether, in the examples caught in the normal section, the sporules and pedicles there depicted lie in a same plane or in different and superposed ones, acquiring thus the appearance of an increased number of sporules. The ratio of the penetrating powers, indeed, viz., the depth of foci in the object-glasses, is inversely as the squares of the same foci; consequently under a 2-mm. lens we may see at nearly the same level objects which under a 1/25 (one-millimeter focus) appear instead, by focusing, to be superposed the one upon the other in four distinct planes.

(*d*) The fourth element is a kind of viscid substance or glair which involves the fruitful heads (Fig. *a*), proceeding in all probability from oozing or secretion, either of the stem or of the spores themselves. That it may proceed from the stem may be stated from some analogy with the gelatinous involvement of the filaments of cladothrix and allied species, and with the hyaline covering which, under a 1/25 immersion, appears surrounding the filaments of *Leptothrix buccalis maxima* of Miller. That it may proceed as well from the cocci would be shown by the capsulated diplococci. Only I will note in passing that the gelatinous coat of the said filaments may be more easily detected under iodine solution, while that of the fruitful heads appears more distinctly under gentian-violet.

Dr. Mendel-Joseph, who had not read my work but only my subsequent papers, in his

Fig. 9 exhibits a specimen of cocci casually adhering to an old fragment of thread, and considers these forms as true fructifications, but similar specimens had already been shown by me under the name of "false ears." For further particulars I refer to page 221 and Fig. 33 of the said work.

(*e*) The fifth element of the fruitful threads of racemosa is a kind of a radicular system noticed by Dr. Miller[27] (Fig. 37, reproduced in the alleged plates Fig. 1, *f*) under the name of branching threads. The specimen there supplied by the author deserves, according to me, the greatest attention as a standard-like example of our cryptogamic planticle, beginning at the bottom from its implantation roots and ending at the top by its fruitful head. It bears indeed an apical fructification quite similar to all the typical fructifications of racemosa, and shows at the bottom, in its implanting place, three distinct branches. That this was precisely the case was implicitly acknowledged by Dr. Williams himself, who termed the one of the two ends a fruitful head—*i.e.,* an apical production—so that the three branches at the opposite end would represent but as many roots in the implanting place of the respective stem, unless we would refer the said form to a casual phenomenon of juxtaposition between single fragments. That no doubt of this kind arose in the mind of the author is made clear by the term "branching" adopted by him, though this term would mean a true ramification process, either upward or sidewise, rather than a radicular system proceeding from the bottom and bent downward. As for the rest, the analogy with the following form, to be described under the heading 2, will afford a further confirmation of the true meaning of the said branches.

Intermingled with these fruitful heads are, indeed, two other forms of aerial-like threads, thriving likewise upon the same felting or matrix as upon a common soil, and these are (2) the younger filaments or paraphyses, and (3) the male organs.

2. The younger filaments were described by me since 1890 in the following terms: "I would rather point out some features, noticeable in a certain number of these filaments, when I have the opportunity of finding them isolated (especially in the unstained preparation), such features not having been considered by previous authors. The first is a division into two or three branches (Fig. 2) which I think must be taken for a kind of radicular system, for divisions are never detected toward the apex; and at its opposite end a swelling or head is noticed. In *a* the filament is broken toward the top and exhibits two long roots; in *b* there are three hook-shaped roots. Both appear to be swollen at their end, like haustoria. What can be the use of these barbs or roots unless to obtain a firm foundation in the ground? And to what purpose is this firm foundation unless to support higher forms of vegetation? The other feature is that of the swellings, which we will call apices or heads, being found at the top of the respective filaments as in *b* and *c,* and these are of varied forms, at times containing a kind of nucleus. There are others which might be styled knotty, being formed along the filament; of these we give no drawing, as they are similar to the preceding ones."

As these forms are extremely liable to disintegration they are more frequently met with in unstained specimens, the manipulation for staining being the cause of their breaking up. In such unstained specimens the threads and the respective roots appear, however, more bulky than in Dr. Williams's photograph, owing perhaps to the stain and to the balsam mount employed by him in the said specimen and to the consequent shrinkage of the thread.

In my second reply to Mr. Goadby[32] I showed that the so-called *Cladothrix buccalis,*

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described by him in 1900, would represent nothing but the above younger filaments described by me ten years before. And this procedure had been already recognized by the author himself, by saying that "Vicentini in his researches, and Williams also, came across this curious organism, but passed it over with a few remarks," and that "Vicentini did not isolate the organism he observed, but there is no doubt that it is the same."[31]

The reason, however, why I dealt so briefly with this form of threads was precisely that in my opinion it was nothing but the same racemosa growth *in its younger condition,* a statement that I am in position to maintain even at present, because I had already described a strictly similar growth upon some flakes or threads of mucus discharged by the male urethra, and (having kept these flakes in a small tube) I had seen a number of true fruitful heads arising from the same. On account of an actual ramification process like that suggested by the author in the said threads, it might be objected that according to my own observations the above swellings or capitula appeared at the top of the respective filaments, intermingled, like so many barren hyphæ or paraphyses, or so many unripe stems, between a number of other matured filaments undoubtedly belonging to racemosa—*i.e.,* bearing at the top their own fruitful heads—a fact which showed that the swellings of the said capitula took place only at the apex of the respective threads.

3. A third form of aerial-like tufts in the upper layer of the growth is that named by me "productions by points or male organs."

An account of these organs, for brevity's sake, will be limited to saying that they seem to begin from "sheath expansion" (Fig. 3, *a,* magnified to 3100 diameters), containing a number of very thin transverse beams between the internal and the exterior contour of an apical duplication of the sheath around the stem itself. When fallen unripe from the stem, this kind of "antherid or spermogone" appears in the form of Fig. 3, *b,* magnified to 2500 diameters. It seems then to retrograde to a neutral or merely vegetative condition, by simple fissiparous multiplication, through the increase of the granules and lineal elements enclosed within the sheath and the reabsorption of the respective segment of central stem. But when undisturbed it reaches the matured form of Fig. 3, *c, d, e,* resembling around the stalk an assemblage of the horsehairs of a cylindrical brush. The central stalk is sometimes simple, as in *d* and *e,* but in other specimens appears multiple and branches upward, as in *c.* The single points or "male elements" of these provisionally named male organs, where fallen from their stem, would finally constitute the swarms of so many spirilli, comma, serpentine, spindle-like, and other slender bacilli swimming through the saliva to such an amount *ut tota aqua vivere videatur,* as said Leeuwenhock. While, indeed, the unripe forms (*a* and *b*) were met with by me very seldom, the matured forms (*c, d, e*), by which the above swimming bacilli would be set free, occurred in more or less considerable number and far more frequently.

Notwithstanding this, in the synopsis given at page 99 of my work, I was inclined to assign for the spirochæta a separate source—*i.e.,* from some slender and curved but independent filaments of the upper layer. Recently I returned to the subject in my reply to Professor Frey[42] before the Fourth International Dental Congress, to which I may refer the reader. Meantime I regret that both the sheath expansion and the matured male organs drawn in Fig. 3 were passed over by other observers. For gathering specimens of the above organs, as I said elsewhere, the *patina dentaria* should be purposely taken *before* a meal, from persons who are not in the habit of using tooth-brushes or powders. The specimens should be gath-

ered in a somewhat bulky mass and mounted unstained without much pressure upon the cover for examination under a medium power or even a dry object-glass. Nevertheless, considering how much these forms are liable to disintegration, I have since found that uncovered specimens, under a water-immersion lens, will answer better than mounted ones.[40]

Here one could ask whether these productions by points are possessed of a radicular system like the foregoing ones, and for my part I am inclined to answer in the affirmative, though the respective drawings I keep between my notes are not sufficiently conclusive. The question would require, I think, further examination, but up to the present my daily duties in medical practice and other difficulties forbade me to attempt the search.

All the described forms, the fruitful heads, I repeat, the younger filaments or paraphyses and the productions by points or male organs, constitute the upper layer of the *patina dentaria*. For the barren threads thriving on the cuticle of the tongue as well as upon the teeth, I refer to my work.

(*B*) Coming now to the deep or lower layer of racemosa growth, I will consider it briefly as composed of two distinct elements—*i.e.* (4), the "lower stumps" would represent so many fragments of the above fruitful stems when truncated or spoiled of their sporules, and fallen over the matrix, growing there as *Bacillus buccalis maximus* of Miller, and (5) the "matrix" itself.

4. The lower stumps can be regarded as the largest bacilli in the mouth endowed with the so-called iodine reaction by their staining violet with iodine and showing often a number of enclosed bacteria within the sheath. These enclosed bacteria, stained instead with gentian-violet, may be seen in Fig. 4, either in a dumb-bell or in an elliptical shape, and the former sometimes placed across, so that I was led to regard them as a further increase of the reserve gemmules spoken of above. The mechanical injuries, indeed, by removing the fruitful heads or breaking up the respective stems seem to induce, in the broken residual fragments, a greater increase in thickness, as happens, for instance, through the retrocession of the ascending sap in the pruning of trees.

It was from this standpoint that I was led to regard the *Bacillus buccalis maximus* of Miller as a simple regressive phase of the fruitful stems themselves, destined, by the breaking up of the respective sheaths, as well as by the spreading and fissiparous multiplication of the previously enclosed bacteria, to propagate the species extensively through fluid as media by a regression of the respective elements from the true and proper reproductive stage (that of fructification) to a merely vegetative condition (that of fissiparous multiplication).

5. The matrix or felting lying around the teeth shows in its turn two constituent elements —*i.e.*, (*a*) the chains and bundles representing the *Leptothrix buccalis maxima* of Miller, and (*b*) the crowded masses of cocci. Of these forms I give no drawing, as they can be easily detected by any one in nearly all specimens of the patina, and on the other hand the connection between the two elements as well as their relationship to the *Zoöglea ramigera* will be mentioned shortly, deserving further study.

(*a*) The chains and bundles analogous to those which thrive on the cuticle of the tongue and which are sometimes formed by ten to fifteen filaments may take up three visual fields. I showed in some instances the continuity of some chains with some filaments. By the iodine reaction these filaments (longer though more slender than the *Bacillus buccalis maximus*) turn blue, dark blue, and brown, a particular to which I shall return later.

(*b*) The crowded masses of cocci may be examined more successfully under methyl-blue stain, which through the various superposed

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layers of cocci gives a beautiful transparency to the specimen. I described toward the end of my work a kind of *Zoöglea ramigera,* growing either in some deposits of diabetic and albuminous urine, or in some sediments of sputum emulsified with potash, which exhibits the greatest resemblance to the said matrix of racemosa. I keep likewise the respective drawings between my notes, but, as said above, I had no further opportunity for reattempting my search.

These are briefly the complex elements of this very complex growth, *Leptothrix racemosa,* which notwithstanding constitutes as a whole a single entity. By considering indeed such an assemblage of aerial-like tufts, showing three distinct forms, implanted on the lower felting as on a common soil, we could hardly conceive how, for instance, fungi of three different species could by a singular kind of commensalism thrive intermingled together upon a same and living felting or matrix, but we must regard the latter as a common mycele or as a common algal base (see later).

The plurality of the leptothrical species in the mouth was lately held anew by Professor Frey,[41] but with this subject I dealt somewhat largely before the Fourth International Dental Congress,[42] so that I need not reopen the contention. I will limit myself merely to observing that as until the last decade the single dissevered bacterial elements were dogmatically assumed to be so many independent beings, those who held to the plurality of the respective species could believe themselves relieved from giving any proof of their assumptions. But after the discovery of racemosa and the acquired idea of the above branching forms in other specimens of bacteria, the position of the question becomes thoroughly changed, inasmuch as the actual independence of this or that asserted species cannot be further presumed *sic et simpliciter,* but needs, case by case, an opposite demonstration. In other words, rather than to charge us with the burden of showing by opposite experiments and cultures the common descent of the single filaments or particles which we see daily growing on the same complex organism, racemosa, and "living here the first stage of their life," our opponents should be charged with the *onus probandi* of the actual independent source and specific entity of the above filaments and particles. Until an exhaustive proof along this line shall be given by our opponents the most plausible presumption will stand on the contrary for the common descent of all or nearly all the repeated forms from a same and common source, or at the most the question will remain open.

In dealing with the subject the unprejudiced minds of Mr. Mummery and Dr. Williams came to agree, at least partly, with my attempt for a simplification of bacterial species. "We must remember," said Mr. Mummery, "that in the infancy of all sciences the tendency has been to multiply the species and to rely more upon minute external characters than upon the more general characteristics of the organism, and in all the sciences we now see individual distinctions yielding to general laws." "The study of the life and plemorphism of the bacteria found in the human organism," said Dr. Williams, "has, I shall venture to say, been too much neglected. The reason for this may perhaps be partly found in the inherent difficulties of the problem and also in that pleasure and prestige which the investigator finds in the cataloguing of so-called new species. And although it has from time to time been suggested by those who have studied this subject from the point of view of the botanist and the biologist that the many forms of bacteria known may in many instances represent but passing or accidental phases in the life history of some other organism, although they have pointed out that many fungi whose life history has been completely followed out have supplied strong evi-

dence that the parent organisms are comparatively few, still the cataloguing of species has progressed until there are now, I believe, not far from a thousand species registered." And elsewhere: "Some of the spore bodies of racemosa apparently begin to multiply by fission before they are detached from the parent stem; then when separated from the stem would have the morphologic appearance of diplococci.

"When single spores with their sterigmata are detached they have the form of the club-shaped diphtheroid bacillus, and sometimes of a curved bacillus. *Leptothrix racemosa* is common to all mouths which I have examined. The forms which must result from the breaking up of the spore heads and stems of this microörganism are long and short rods, various sizes of micrococci, various sizes of diplococci, and various sizes of curved and club-shaped bacilli. I have no disposition to indulge in speculation over these discoveries, but here are the facts which must be reckoned with in all future consideration of the bacteria of the human mouth and body. It would be folly to deny that these facts are big with possibilities. After the most thorough cleansing of my own mouth by the aid of tooth-brush, pick, silk floss, and powerful germicides, I have, after forty-eight hours, found the fructification heads of *Leptothrix racemosa* growing luxuriantly. They must therefore develop with considerable rapidity. However much we may be disposed to reticence, it is impossible to avoid asking what becomes of the enormous number of microorganisms of different forms and sizes which are being constantly shed into the mouth by this parent organism, and how many of them have been classified as permanent species."

Mr. Watson and Professor Frey acknowledge likewise some truth in my views about the common descent of most of the scattered bacterial elements of the mouth,[36] and in the same Mr. Goadby concurred partly in the said opinion by saying that "some of the thread forms described by Miller may be portions of the threads of racemosa," and that "it is extremely likely the *Leptothrix racemosa* was figured as one or other of these thread-forming bacteria" (*Leptothrix buccalis maxima* and *Leptothrix innominata* of Miller).[31]

To these remarks it may be added that the three forms of aerial-like fungi above described, thriving upon a common soil, appear intermingled together constantly in all mouths, and that none of them was hitherto found, neither in the external world nor in other parts of the body. Now what place ought to be assigned to the described organism? What, in other words, may be its botanical diagnosis?

Professor Miller, who was inclined first to refer the new organism to the genus Cladothrix, said before the Fourth International Dental Congress that "we have undoubtedly a wonderful and most important organism in *Leptothrix racemosa,* but its life history is far from being cleared up." As for me, while thanking the learned professor for the first part of his statement, I could not agree so well with the second part, for the reason that of the life history of racemosa we know something, while of that of the hundreds of other asserted species of bacteria we know nothing but their laboratory habit. We, among the other things, are ignorant even whether they are true and proper organisms or simple appurtenances of some more complex organism.

Mr. Goadby first referred the new organism to *Crenothrix Kühnicura,* a statement which was at the same time denied by Mr. Mummery and myself, though independently the one from the other. Lately Mr. Goadby referred, instead, the same organism to Penicillium, holding that the sporules were connected with one another longitudinally rather than transversely, one by one, with the central stem (see literature, 27 to 32).

Professor Arkovy suggested changing the

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term *Leptothrix racemosa* to that of *Ascomycetes racemosa* or *Chlamydothrix racemosa.*[33]

Professor Frey in his turn was inclined to refer the new organism to Aspergillus or Mucor, and I dealt with the subject before the said Congress.[42] Dr. Mendel-Joseph repeated likewise the suggestion advanced by Professor Frey, because the sheaths of racemosa filaments, when treated with chlor-iodide of zinc, did not reveal, like the thallus of mucorini, the presence of cellulose.[43]

Dr. Mendel-Joseph asked himself the same question, whether the fruitful heads of racemosa could, on the contrary, be referred to Perisporiaceæ, but I may observe that no trace of chlamydospores, of receptacles, and other morphologic characters of the "ascophore stage" of this group of fungi can be detected in the above heads, so that they could at the most be related to the "condiophore stage" of the same fungi, known as aspergillus form, a suggestion already discarded by the author himself.

On the other hand, all the said suggestions appear likewise defective from being limited to the botanical diagnosis of the fruitful heads alone, apart from any consideration of the other appurtenances of this very complex organism and of the mutual relations between them.

For my part, since 1890, in dealing with the aerial-like tufts of the new organism, I said: "I call it aerial vegetation, because the stems of the microphyte have a tendency to rise in the air, although immersed like the algæ" (page 38 of my work); and in 1892: "Neither is it our business to solve the question whether the discussed parasite is a fungus or an alga. We shall only say that it appears to us to partake of the characters of both families, to thrive as an alga, but to fructify similarly to certain fungi" (*ibid.*, page 178).

In my subsequent articles I touched again on the subject, though with reservation, calling attention to the inherent difficulties of the problem. Now I must beg your pardon if I return to it in more detail.

In my third reply to Mr. Goadby[40] I showed that the whole bacterial group should henceforth be ranged into two distinct series, namely, that of the highly evolved or true and proper complex microörganisms, embracing together with racemosa the forms growing in old cultures which were mentioned in the beginning of this paper, as well as the obvious forms of crenothrix, cladothrix, etc., which according to the terminology of Van Tieghem we may call *higher bacteriaceæ,* and the lower series embracing the rudimental bacterial elements whose life history appears still confined within a merely dissevered or monocellular condition, and which, according to the terminology of Sédillot, we may call simple *microbes.* By Professor Miller some forms belonging to the higher series, as Leptothrix, Cladothrix, etc., were regarded as "cumulative forms of bacteria." In some other treatises, that of Mr. Goadby for instance, a distinction was generally made between the two series, but without further consequence, and the monocellular nature of bacteria was still maintained, little or no attention being paid to the life history of racemosa as a growth having, in the mind of the writer, little or nothing to do with the bacterial flora. I am inclined rather to believe that the lower series itself may be regarded for the most part merely as a provisional one, inasmuch as a further number of the above monocellular forms may sooner or later be raised into the upper series, on their being acknowledged as the result of further study to belong to some complex growth.

But the complex structure of the new organism exceeds so far that of the higher bacteriaceæ just now mentioned that in order to understand both its morphology and biology we are invited to look at other more complex

groups of the cryptogamic scale rather than at the bacterial group alone.

We have seen that various observers were inclined to place the new organism among the fungi, and no doubt the upper tufts look remarkably like an assemblage of fungous hyphæ; but they do not constitute *all* of the group, and we shall see later that a simple fungus could by no means reach the perennial life and fructification of racemosa. For the moment, by considering the implantation method of the tufts themselves, I will limit myself to observe that the stems of these tufts do not appear to spring directly from the lower filaments lying around the teeth, but to be simply attached to the same by their own roots (the radicular system spoken of above), so that the lower felting does not appear to play the part of a mycelium as would be the case if the above stems represented simple aerial-like branches extruded from the lower filaments of the felting itself. On the other hand, the arrangement of the latter around the teeth, and the same term "Leptothrix," introduced by Kützing, designating the *uncolored filamentous algæ,* would point accordingly to some relationship of the said felting to the algæ. From page 158 to 161 of my work I quoted some of the authors who held a close relationship between the bacteria in general and the algæ, particularly the Cyanophyceæ. Robin also, as was said above, regarded his Leptothrix buccalis as an alga. The crowded masses of cocci intermingled with the lower filaments would afford, in their turn, a further confirmation of this view, the presence of such crowded masses of coccus-shaped bodies being unusual between the mycelial filaments of fungi. Neither could these cocci be regarded as sporules or gemmules fallen from the upper layer owing to the bulk and pyriform appearance of the former resembling rather those of the *Zoöglea ramigera* spoken of above. Hence in the new organism we would be confronted with a duality of structures, viz., with a fungous growth (the upper tufts), and, beneath the same, a creeping layer resembling an algal felting.

Now from the moment that the new organism cannot be regarded either as a simple fungus or as a simple alga, but rather as a superposition of the two structures, to what kind of association could the superposition here concerned be referred, unless to that of lichens, whose prominent character lies just in the superposition of a "fungus constituent" to an "algal base"? Here it is not a matter of a fortuitous superposition of a normal or degenerate phanerogam or of a moss upon other phanerogams, by epiphytism, by antagonistic symbiosis, or by parasitism, as in the so-called *plantæ conviventes,* but of a fungous overgrowth, thriving indestructibly upon a living alga; here the relation between the two structures living together is not merely a one-sided one, as in the above plants, in which the adventitious guest takes a portion of nourishment from the host, through suckers or rhyzoids, without mutual benefit to the host itself; neither is it a matter of saprophytism, as in the fungi thriving upon algæ in maceration or other lifeless bodies, nor of parasitism, as in the fungi thriving through haustoria, at the expense of living plants without any benefit or with more or less detriment to the latter. A relation of mutual dependence or reciprocity known as "mutual commensalism or symbiosis" characterizes instead the lichenic organization and makes of the two elements, the fungus constituent and the algal base, a single "composite structure," securing in this way the perennial life and fructification of as many lichenic species. I do not know whether such a coexistence of a fungous overgrowth upon a living alga, without any detriment to the latter and with a perennial life of the whole, has been hitherto registered outside the domain of lichens.

Here, in order not to be misunderstood, I make haste to declare that, in speaking of lichens, I do not pretend to state a closer relationship (a true and proper homology or connection by common origin) between the latter organism and racemosa owing to the striking difference which intervenes between the bulk and the morphological characters of the two kinds of growth, but only a simple *analogy* in their *modus vivendi*. While, indeed, the morphologic characters of the new organism, as described in the foregoing pages, look so different from those of lichens, a more or less close analogy in the respective "biological characters" and in the "plan of organization" may on the other hand be acknowledged between the two kinds of growth, a parallelism in the plan of organization being allowable even between organisms of quite different species and groups. And, in order to understand, so far as possible in the present state of our knowledge, the peculiar life habit of this organism, it is precisely along this line that, in my opinion, *a botanical diagnosis of the same can be attempted*. But, in doing so, it is to be borne in mind that by merely such a biologic analogy in no way could racemosa cease from being what it properly appears to be, *i.e.*, a bacteriacea, as shown by the numberless bacterial elements, filaments, chains, rods, bacilli, bacteria, cocci, comma, spirilla, spindle-like, snake-like and other slender particles which are daily shed by this parent organism into the mouth.

That the simple appurtenances of racemosa bear a close relation to one another was already pointed out in dealing with the constant association in all mouths of the three forms of tufts upon a common felting, none of them having been hitherto found isolated, neither in the external world nor on the teeth or in some other parts of the body. Now that the relation between the two superposed layers cannot be regarded as a merely one-sided one, but approaches rather the character of a mutual commensalism or symbiosis more or less analogous to that of lichens, will be shown by a short review of the biologic characters of the new organism which may be summarized as follows: (*a*) in respect to the staining reactions; (*b*) the mutual relations between the appurtenances; (*c*) the relation between the growth and the soil; and (*d*) the duration of life.

(*a*) We have seen above that by the iodine reaction the lower filaments of racemosa turn blue, dark blue, and brown—a characteristic which was noticed only in bacillus butyricus and some other "granulo-bacteria" owing to the presence of granulose or starch. In some specimens the iodine reaction in the inner part of the said lower filaments gives so dark and brown a color as to approach in some way that of lichenin (a substance closely allied to starch). We have just now seen that the filaments of racemosa do not exhibit, like the thallus of mucorini, the reaction of cellulose, when treated with chlor-iodide of zinc.

(*b*) The power of resistance against the mechanical injuries and the rapid restoration of any missing part shows in the second place the close connection between the various appurtenances of the new organism, in spite of the rough usage to which it is exposed in the mouth. From which we may conclude that these various appurtenances do not antagonize one another but rather seem to derive mutual benefit, and in their turn the upper forms derive benefit from the lower one, and *vice versa*, the fungi and the matrix constituting as a whole a single complex organism. In other words, while the constituents are various, the organism appears to be one alone. How could we understand otherwise the rapid reproduction of the above tufts, as was verified by Dr. Williams after the most thorough cleansing of his own teeth, if the single fungi regerminating thereupon were due to separate germs coming one by one from without? To this it may be added that the upper fungi cannot thrive apart

from the lower felting, and that the *Zoöglea ramigera* above mentioned as the point of departure of the matrix does not exhibit filaments (see page 222 of my work) until it comes to take part in the formation of the lower felting of racemosa on which the upper fungi would subsequently take root.

(*c*) The firmness of the soil appears so intimately connected with the perennial life of the growth that, as I showed in my communication to the Fourth International Congress, the growth itself does no harm to the teeth. Hence even under this heading the life habit of the new organism comes to approach that of lichens, which do not nourish themselves at the expense of the soil but only of the surrounding medium. Lichens do not require, indeed, from the soil a nourishing supply, but only a simple support. Even on the bark of the trees they do not thrive as parasites, and also when saprophytes or semisaprophytes they take up the supply from the surrounding medium rather than from the host.

(*d*) The longevity and perennial fructification of racemosa resembles even more closely that of lichens, which may live for centuries, and, as said Nylander, may be always in a state of fructification, whereas the common fungi enjoy but an ephemeral life shorter than that of the decayed organisms or organic matters which feed them. Racemosa, likewise in perennial fructification, defies all attempts of destruction, as was verified by Dr. Williams. It not only accompanies man during the time allotted to him upon earth, but its remains were found undestroyed within the dental tartar of the Egyptian mummies by Zopf and Professor Miller. With some other biological characters, namely, the habitat, the part played by the lower felting, and the fructification method of racemosa, we shall deal later on. For the moment, by considering the above biologic analogies on the one side and the morphologic differences on the other, both from the standpoint of the part which the two groups, bacteria and lichens, play in the economy of nature, we may to some degree understand the logical reason of the above facts.

Bacteria and lichens appear indeed to be directed to the performance of a distinct series of functions in the economy of nature. The part played by bacteria, in the disintegration of the rocks, the elaboration of the humus, the nitrification and other processes related to vegetal chemistry, could be at a first glance compared to that of lichens in the disintegration of the most compact lava granites and other rocks, ending likewise in the elaboration of the humus. But between the two processes is interposed the notable difference that the rhizinæ of lichens act by a merely mechanical penetration through the minute interstices of the rocks without requiring from the soil any nourishing supply, while bacteria thrive instead at the expense of the hosts themselves, acting by chemical changes upon their refuse products or decayed textures. Hence the penetration of bacteria appears by far more apt to pervade and spread diffusely through the body of the respective host, by their scattered particles, which for the purpose were made far more minute, slight, and prolific than those of lichens.

To the same reason should be related, on the other hand, the fermentative power of bacteria at the expense of the organic matters—a power which appears completely extraneous to lichens—as well as the obvious fact that bacteria are more commonly met with in a dissevered condition, and under such a condition may be cultivated through fluid or semifluid media, resembling therefore as many monocellular beings.

Hence it seems that as long as bacteria are fulfilling their dissemination phase at the expense of organic matter, both their morphologic and biologic characters are prominently different from those of lichens. But when

nature needs an inexhaustible preserve of such bacterial elements for most of the life changes occurring in the animal (either in the digestive process or for the assimilation of corrupted matters and histologic elements in decay to be eliminated from the living economy), when it needs a firm soil for a parent organism and consequently places the latter over the teeth, at the entrance of digestive and air-passages, it is led to revert to a duality of constituents and to a plan of symbiotic organization more or less analogous to that of lichens in order to secure fructification which could not have been reached by a fungous growth alone. And thus it happens that the biologic characters of the new organism approach those of lichens, while the morphologic differences between the two are kept for the most part unchanged.

The exogenous fructification method of racemosa, in order to spread countless swarms of extremely slight and minute sporules and particles through the posterior organs, appears in its turn to depend upon the same law. A fructification by apotheces or by simple asci would have required a far greater space and depth for the whole growth. It would have in the meantime furnished heavier sporules and in a far more limited number. Even Dr. Williams emphasized the compact shape of the fruitful heads of racemosa and the shortening of their pedicles, both for want of space and for securing the maturity of the sporules, which "would probably never be reached if they were developed on sterigmata as long and slender as those of *Racemosæ gramines* and *Excidia scipulosa.*" Here let me add a few remarks on some further analogies and differences between lichens and racemosa.

The habitat of lichens is in the open air, while racemosa seems to be nearly an aquatic organism. When accidentally fallen in an immersed condition, the algal base of a lichen could survive, but owing to the alteration of the surrounding medium its fungus constituent would be destined to gradually fall into atrophy and decay. And no doubt such would be the case for most of the lichens. But various lichens thriving on marine rocks, as the *Lichinæ, Verrucaria fluctigena,* etc., are bathed by the sea water, and during the flood tide undergo an immersed condition which alternates with the life in the open air during the ebb tide. *Verrucaria consequens* thrives on the shell of some aquatic crustacea (see later). Often in fresh water, on the rocks and stones approaching water level, thrive other Verrucariæ, as *V. Rivulicola, V. inundata,* etc. Now the immersed condition of racemosa, likewise bathed rather uninterruptedly and deeply in the saliva, does not substantially differ from that of the said lichens.

The want of true and proper "gonids" in the lower felting of racemosa, whose crowded masses of cocci do not bear chlorophyll, would constitute another notable difference between the said organism and lichens. But I may observe that often the algæ themselves, when thriving in corrupted waters loaded with organic matters, do not bear chlorophyll, and that in some lichens the gonids may be present in some individuals and not in others. The latter are by this way confined within a saprophytic or semisaprophytic condition, but, notwithstanding, may reach their full development, while owing to the presence of organic matter the decomposition of carbonic acid, for the fixation of carbon, would become necessary to their growth.

The habitat of racemosa upon living, hard, and bathed parts of an animal body, like the teeth, would seem at first glance to be absolutely improper for a lichen. Some of the lichens are indeed corticoli, others saxicoli or hurnicoli, and others thrive upon various mineral or lifeless bodies—iron, glass, bones, fossil shells, etc. But in *Verrucaria consequens* just now mentioned we have an example of a perfect lichen thriving in its turn upon a living,

hard, and bathed animal texture—*i.e.,* upon the shell or "carapace" of certain living aquatic crustacea of the genus *Balanus,* by an imperceptible thallus nearly confused with the shell of the animal, and apotheces resembling black points and bearing binocular spores within ventricous asci. I have at hand a specimen of the said shell with the respective lichen still adhering, sent me by our lichenologist, Professor Satta, who had taken it with the late Professor Nylander.

Lastly, the exogenous fructification of racemosa would seem thoroughly different from the common fructification method of lichens, by apotheces and asci. But samples of a merely exogenous fructification, by conidia spores, may be seen in the genera *Cora* and *Rhypidonema* and other species belonging to the family of the hymenolichens. Other lichens exhibit analogous fructification methods by conids and conidiospores, though intermingled with apotheces as *Peltigera rufescens,* where the basidia, bearing every one a single stylospore, are kept in the shade within the respective pyenids, *Anaptychia ciliaris,* with pyenospores previously known as spermatia, etc. A free conidial production, intermingled with apotheces, may be seen instead in *Chrysogluten Biasolettianum,* a new lichen described by Professors Briosi and Farneti, of Pavia. The lichen alluded to develops on the border of recently cut branches of the pruned vines, in the form schematically drawn in Fig. 5, where in the interspaces between the apotheces, from the gelatinous surface of the thallus, project upward numerous conids resembling those of a Fusarium. The conids spring from branching and separated stems embedded in the depth of the thallus. More recently, however, the lichenic nature of the said growth has been invalidated by Dr. Gabotto, who would regard it as a simple fungus. Certainly in racemosa appear neither apotheces nor asci, and the exogenous fructification itself looks thoroughly different; but the quoted samples of a conidial production in so many true and proper lichens will suffice to show that we do not know at present where the actual or eventual varieties in the fructification method of lichens may stop, and that meanwhile an exogenous sprouting of germs may take place as well in the latter organisms.

It should be remembered that, according to Flattier, the fungus, when thriving upon a somewhat dry and nitrogenous soil and freely supplied with oxygen, may fructify by asci, in the form of a mucor, and when upon a moistened soil, by penicillar tufts. It may therefore present both fructifications, either contemporaneously upon a common mycelium or successively by the so-called alterations of generations. One could, for instance, obtain at pleasure a penicillium from a mucor, and *vice versa,* while, in an immersed condition accompanied by deficiency of oxygen, the fungus could thrive only under the form of a ferment.

In order not to go too far I forbear from giving here a detailed account of the views recently advanced by Professor Minks, of Stettin, on the superposition of two different lichens, the one bearing its own fructification upon the fertile or barren thallus of another lichen, which could throw perhaps some light on the subject. The superposition alluded to was noticed by Professor Minks in 208 species of lichens, under two distinct conditions, which he called "syntrophy" when the fruitful lichen, being unable to live independently, needs the support of an alien thallus during its whole existence (which was verified in 133 species), and "protrophy" when temporarily (which was verified in 75 species). In some instances the advent of the superposed lichen causes the sterility of the host, but in other cases the latter may continue to bear its own fructification. Now the existence and meaning of the above radicular system being once confirmed, the act of symbiosis in racemosa would take place be-

tween the radicular system and the matrix, as was pointed out above, and would consequently approach in some way the superposition of two different lichens, the lower felting playing the part of a barren thallus and the upper tufts that of a syntrophic fungus constituent, while in the common lichens the symbiosis, according to the heterogonidists, would occur instead between the gonids and the filaments of the thallus, which by their interlacing or budding finally give origin to the organs of reproduction. But I leave to competent lichenologists the solution of the question whether and to what extent such a phenomenon of syntrophy or protrophy may be acknowledged in the new organism.

The fructification of apotheces was perhaps provided by design to protect the spores against the atmospheric changes in organisms so exposed to the open air as lichens. Nay, some lichenologists have gone so far as to suggest the existence, in the lichens above mentioned, of an exogenous method of fructification either intermingled or not with apotheces, which has been provided beforehand, as a more perfect method for eventual cosmotelluric changes, through which, according to Acloque, such a fructification method might lead to some further improvement of the lichenic species and become, lastly, the only reproductive method of the future species up to the final disappearance of the actual thecaspores.

By this I do not claim, I repeat, to hold that we bear in the mouth a true and proper lichen, like those we daily see for instance on the bark of the trees or on the tiles of the roofs. Nay, in my work and subsequent articles, as well as in the foregoing pages, I have, on the contrary, ranged the new organism in the higher series of the bacterial group, embracing the highly evolved and complex microörganisms which show a more or less remarkable development toward higher forms, while most of the lower bacteria, taken from the normal or morbid states or products of the body and cultivated as such in artificial culture media, would in my opinion be nothing but as many scattered particles of racemosa, excepting only the accidental mixture of this or that foreign bacterial element still confined within a merely dissevered or monocellular condition.

Hence, wishing, at least provisionally, to advance a botanical diagnosis of the new organism, we may regard it as a higher symbiotic and perennial bacteriacea, harmless to the teeth, but destined to spread its scattered minute particles throughout the whole economy, and which for its composite structure, for its perennial life and fructification, as well as for the mutual relations between its various appurtenances, or between the lower layer and the soil, appears to have been framed according to a plan of organization and endowed with a life habit, both resembling, though in miniature, the plan of organization and the life habit of lichens. By this way the nature of the growth would remain unchanged, only the conception of the whole bacterial life being considerably enlarged and raised in the cryptogamic scale to a much higher degree than that universally accepted before.

In order to complete or rectify this provisional diagnosis, it needs a further study both of the radicular system and of the lower felting, inasmuch as it would be, thanks to such a composite structure, that the new organism could have been enabled to reach its perennial life and fructification. I hope that other more skilled observers will take an interest in such researches, carrying them farther and advancing them to a degree that for my part I have been hitherto unable to reach.

With the so-called pathogenic power of racemosa, and especially with asserted relation to dental caries, I dealt somewhat largely in my communication to the Fourth International Dental Congress, from which I will permit myself to reproduce here the following: "Con-

sidering from a synthetical standpoint the beauty of the human denture so properly emphasized by Dr. Perry, its rôle in utterance, and its more essential part in eating; considering on the other hand the wonderful harmony between the various histologic elements of any single tooth—the hypothesis of Dr. Watson and Professor Frey being once accepted—we could not absolutely state which of the two ought to be more admitted, whether the wisdom of nature in forming, on the one hand, so essential and perfect parts, or its incongruity in placing soon after with the other hand such a tenacious and fatal growth upon the same parts, in order to hasten as far as possible their decay. And still less could we understand why, by good fortune, nature itself would have forgotten to repeat that same play at the expense of other organs or parts of the body, on which bacteria are likewise overspread."

I cannot recall here in detail my subordinate views on the etiology of caries and the criticism I made bold to advance before the said congress against the germ theory held by Professor Miller and other competent observers. Only I regret that the learned professor came to attribute to me an unreserved agreement with the views of Dr. Eben M. Flagg, of Asuncion, Paraguay, on the subject, while these views were but cursorily mentioned by me in order to show that the germ theory of caries was far from being universally accepted. In a short abstract from the Third International Dental Congress I found that Dr. Flagg refuted the theory of an aggression of bacteria from without, holding caries to be an "eruptive disease;" but by a subsequent paper of Professor Miller (*Dental Cosmos,* 1905, pages 1293, 1301) I learn now that Dr. Flagg partakes instead the same germ theory held by Professor Miller, only dissenting from him in the way assigned to bacteria in attacking the teeth—*i.e.*, from within outward—the only point on which I may henceforward agree with Dr. Flagg. By both the authors, indeed, the bacteria infecting the dentinal tubules are regarded as hurtful *per se,* while in repeated communications I held, on the contrary, that the bacteria thriving *within* the tubules are nothing but scattered particles of racemosa. I showed elsewhere how the numberless particles shed every moment by this parent organism into the mouth are subsequently carried through the posterior organs—*i.e.*, the digestive, genito-urinary, and air-passages—where they thrive to such an extent that one of the said habitats, the intestinal tract, was called for autonomasia "paradise of the microbes." I showed likewise how the same scattered particles are thence spread through all the parts of the body and become in this way ubiquitous, dwelling everywhere (to put a case, in the dentinal tubules) in a state of rest. I showed lastly that they have no power upon sound structures, but only after the loss of strength after decay or decomposition of the affected parts (as in the case of fibrils and other appurtenances of the pulp) the repeated particles, aroused from rest to activity, would be called suddenly to thrive and multiply at the expense of the parts themselves. They consequently would have nothing to do with the causation of caries. Moreover, for both authors the multiplication of bacteria precedes the decay process, while for my part their multiplication neither precedes nor accompanies but only *follows* the disease, the respective germs already dwelling within the tubule, as in all the other parts of the body, though in small number and in a state of inactivity, and multiplying luxuriantly only after the alteration of the part. At any rate, that the germ theory of caries is still far from being universally accepted is shown by the article of Professor Miller quoted, where, besides the views of Dr. Flagg, the ptyalin theory of Dr. Hinckins, as well as the mucin or mucus theory held by various authors, is criticized. Neither can I agree with Professor

Miller in his statement that my "views tend to diminish the importance of external agents on the causations of caries," inasmuch as the external injuries, the chemical changes, and other local or general conditions, far from being unacknowledged, were explicitly mentioned in my communication, only the germ theory being subjected to criticism. As for the rest, I shall perhaps return to the subject in a further communication.

I cannot forbear now at the end of this paper from presenting to you a few remarks upon the culture methods suggested by various authors, and lately commended anew by Dr. Mendel-Joseph, for the botanical diagnosis of the new organism: "For a reply it is necessary to resort to histologic and experimental method isolation, pure culture physiochemic reaction as well as physiologic in a word, to this rigid method of modern bacteriology which Vicentini criticizes with spirit and not with eloquence."

But while thanking the author for his indulgent appreciation of my views, I must make a distinction between the so-called pure cultures of dissevered bacterial elements on the one hand and the artificial synthesis of lichen or the reproduction of the common fungi upon artificial soils on the other. The latter methods could, indeed, be allowed by us without admitting the first one, because in the so-called pure culture method it is precisely the "monocellular nature" of bacteria that is *sub judice,* and it would be a mere begging of the question, a *petitio principii,* to defer to the cultures themselves the decision of the controversy. The method of so-called pure cultures, indeed, relies upon the same postulate of the "monocellular nature" of bacteria which is subjected to critcism.

To this it may be added that the attempts to obtain so-called pure cultures of buccal microbes did not succeed in the hands of various skilled experimenters, except that in some peculiar instances a few elements scantily grew on the respective artificial media. At any rate, we could hardly conceive what practical results could be reasonably expected from such experiments for a botanical diagnosis of racemosa.

Here one might object that the same difficulty encountered in the above attempts at cultivation of various buccal microbes would disprove any relationship between the same and the analogous bacterial elements, which thrive either in localities the seat of morbid processes or in sound structures of the body, and were regarded by me as simple scattered particles of racemosa, from the moment that the cultivation of the latter bacteria, taken from the above seats or structures, does not present the same difficulty. But it is to be borne in mind that as long as the scattered particles of racemosa are still endowed with their original properties in the mouth "for the reproduction of the parent organism" they behave in accordance; but after their migration through other parts of the body, where they cannot do so, they would retrograde to a merely vegetative condition, working there as scavengers or necrophagous agents by simple fissiparous multiplication, and reaching, by this way, a larger faculty of adaptation to artificial media.

Neither can the differences in the so-called pathogenic or non-pathogenic power assist us, as said Professor Fraenkel, in identifying species of bacteria. Professor Miller and Dr. Kirk pointed out the hurtful properties of the micrococcus of sputum septicemia as a proof of its independent source. But I have elsewhere shown that, after the discovery of racemosa and the above ramification process noticed in some old cultures of various bacteria, the so-called pathogenic power cannot be further maintained as a power originally inherent in their "botanical entity," and consequently cannot be further relied on as a distinctive criterion for the classification of bacterial species. This I hope to explain more particularly in a further com-

munication. For the moment I will limit myself to the observation that the micrococcus of sputum septicemia would represent accordingly nothing but a "protective phase"—*i.e.*, a resting stage like that of the hypnospores—by which the said cocci would be kept dormant within the respective capsules, like a reserve fund, possessed for further conditions of the pabulum and surroundings. This micrococcus may thrive indeed in nearly all mouths. Hence by the artificial transplantation of the same cocci in huge masses in parts of the body where nature neither intended nor consented they should be, and by want of an adequate counteracting power of the same cocci against the decomposition of the morbid product or of the culture medium from which they were taken, we may understand their hurtful properties. But it is to be borne in mind that though mostly unknown the causes may be numberless by which a bacterial culture can prove hurtful to animals experimented upon (see pages 203 to 216 of my work and literature[30]).

It remains then to have recourse to an "artificial synthesis," to a rebuilding so to speak of the new organism as a whole, upon artificial media, as if the "original synthesis" already accomplished by nature upon our teeth were not satisfying enough. But racemosa, I think, will defy any attempt of cultivation upon artificial media, its fruitful heads and other aerial-like tufts being unable to develop apart from the preëxistent felting or matrix provided by nature upon the teeth, as was said above.

On the other hand, the usual culture methods seem to interfere *per se* with any further development of the bacterial life beyond its "dissemination phase"—*i.e.*, the fissiparous multiplication of the respective rudimental particles. It seems that in the bacterial group, as in mycelial fungi, no aerial growth can take place, until both the above dissemination phase and the immediate nourishing pabulum become exhausted.

In my previous articles and in the foregoing pages I have pointed out how many so-called pathogenic bacteria are now conjectured by the bacteriologists themselves to be nothing but as many passing phases either of streptothrix or of ray-fungus or of some other complex organism. Now the method of so-called pure cultures appears not only to interfere with any further development of bacterial life, but (by keeping as far as possible each type of them apart from all the others) to work so that the respective dissevered condition tends to become a permanent one, any further development toward the respective parent organism being by this way effectively precluded. This capital subject was touched on in my reply to Mr. Mummery in the following terms: "It was because of the unnatural life conditions upon artificial soils and through artificial surroundings that for the last decade the natural history of bacteria has been to some extent misunderstood, through a jumbling of experiments and assumptions which do not provide room enough for the right observation and understanding of the natural phases and behavior of these microscopic organisms."[30]

This notwithstanding I succeeded twice in obtaining fructification of racemosa, first in a pulmonitic sputum and afterward upon some flakes of urethral mucus, as has been said elsewhere. I was not at that time acquainted with the above mentioned *Zoöglea ramigera* thriving sometimes in certain sputa or in some urinary deposits, consequently I did not search for it; but probably the reproduction of the fructifications alluded to was due precisely to the presence of the said zoöglea in the respective specimens, the zoöglea itself being, in my opinion, the point of departure of the matrix of the new organism. But, I repeat, I had no further opportunity for reattempting my search.

B. J. C

Hence I remain somewhat skeptical about the so-called pure cultures. The only practical results of this method, from the botanical standpoint, was perhaps that already mentioned of a kind of ramification process or morphologic development toward higher forms, noticed by the way in some old cultures. I do not insist on the importance of the fact, in order to confirm the passing character of the monocellular condition of bacteria, but I cannot refrain from noting that the fact itself, far from being a direct result of the method, came instead to light unexpectedly—nay, I shall venture to say "in spite" of the method itself. As for the rest, I may freely agree with Dr. Mendel-Joseph about the use of the chemical tests, as chlor-iodide of zinc, iodine solution, etc.

Coming now to the conclusion of this paper, I trust that I have supplied a sufficiently descriptive sketch of the new organism and of its various appurtenances for all our professional brethren who would undertake personal researches on the subject. That the said organism does no harm to the teeth was first shown in my previous communication to the Fourth International Dental Congress,[42] and has been partly summarized in the foregoing pages. How nature provided by this way an inexhaustible supply of bacterial elements—*i.e.*, of minute scattered particles to be shed by this parent organism into the mouth, and how the said particles are consequently carried through the posterior organs, namely, the digestive, genito-urinary, and air-passages—has been already shown in my work and subsequent papers. How, lastly, the repeated particles become ubiquitous throughout the whole body, in order to work here and there as scavengers or necrophagous agents, I propose to show, I repeat, in more detail in another paper.

I hope meanwhile that not only the students of the buccal flora, but even the medical practitioner working with the microscope, will take an interest in the subject and endeavor to make personal researches on the parts alluded to. Experience has shown, indeed, as I pointed out elsewhere, that those who have not actually verified the fructifications of racemosa with their own eyes can hardly become convinced of the real importance of the new organism.

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ETIOLOGY OF APOPLEXY.

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For the purposes of this article the word apoplexy is limited to hemiplegia resulting from vascular disturbances in the brain. Of these there are the time-honored three: hemorrhage, thrombosis, and embolism, named in order of frequency, about 55 to 60 per cent of all cases being due to cerebral hemorrhage, 30 to 35 per cent being due to thrombosis, and 10 per cent to embolism. Clinically, hemorrhage and embolism are characterized by a rapid onset, and thrombosis by a slow one, thus the rapidity of onset aiding in an etiologic diagnosis. Yet it is to be admitted that hemorrhage may be slow in onset, and thrombosis rapid. Moreover, the onset of hemorrhage and of embolism is associated with physical or psychical stress, while thrombosis occurs when mind and body are in a maximum of repose, a fact also aiding in diagnosis. Still, hemorrhage may occur in repose—even in sleep, according to Gowers. The pathologic effect of the three sorts of vascular accidents varies; hemorrhage causes a gross and sudden destruction of brain tissue, whereas embolism and thrombosis by cutting off the blood-supply produce cerebral softening in a sense absolutely literal, or encephalomalacia.

I. *Causes of Thrombosis.*—Thrombosis is not a disease in itself, but is merely a symptom in a series of widely diversified diseases. It is

not absolutely distinct from embolism, but overlaps the latter in that parietal thrombi by breaking loose may become emboli. Hence thrombosis and embolism may actually coexist. The actual cause of thrombosis in every instance is disease of the artery wall (*a*) existing by itself, or (*b*) in association with increased coagulability of the blood.

(*a*) As a rule the one general cause of thrombosis is *disease of the artery wall alone.* The disease found is usually atheroma, which according to Huchard probably results from a primary disturbance of the vasa vasorum, which for some unexplained reason contract, and so permit a lessened flow of blood to the arterial wall. Since the intima is the farthest removed from the territory of supply of the vasa vasorum, and is therefore the first to be deprived of its blood, it is the first to undergo degenerative changes. Reactionary hypertrophy then supervenes in both media and adventitia, and even periarterial productive inflammation may secondarily develop.

Better than Huchard's hypothesis of the pathogenesis of arterial disease is Thoma's, which is based upon a carefully matured set of *a priori* considerations and preliminary observations. If the blood-supply of an organ is to be normally maintained both at rest and in functional activity there must be provided some device for the regulation of the mass of blood to be delivered in a given time, and therefore of the rate of flow. Obviously a variation in the caliber of the artery from time to time is a necessity, and the elasticity of the media affords the mechanism by which a perfect balance between supply and demand is maintained. If the media should for any reason lose its elasticity, as it does with advancing years or great vascular strain, then a dilatation of the vessel will follow. By the well-known law of physiologic adaptation (physiologische Anpassung) nature will try to remedy the defect, and does so in the only manner possible. To bring down the dilated vessel to a normal caliber new tissue forms between the lamina elastica interna and the endothelium; and to restore the lost elasticity new tissue forms in the media. Thus the artery *compensates its own defects,* as does the heart in valvular disease by hypertrophy. But just as hypertrophied tissue in the heart degenerates with advancing years, bringing on broken compensation, so also the newly formed arterial tissue is prone to degenerate, producing the familiar atheromatous plaques and calcareous deposits. It is because of this secondary degeneration of the interior of the arterial wall that blood-clots form upon it, and they are therefore named parietal or wall thrombi. As a rule the thrombus begins as a deposit of blood-plates over the diseased area. To these are quickly added numerous leucocytes, and the whole mass is woven through and through in every direction with fibrin-threads, making the familiar "white clots" found post mortem firmly attached to the wall of the artery. Further growth of the white clots ultimately leads to a complete stoppage of the blood-flow through the artery, so that cerebral softening takes place in the area of supply.

The causes of the atheroma thus become the causes of thrombosis; and these are age, intoxications, and infections. Senility is a causal factor of huge potency. Indeed, atheroma is as a rule a disease of advancing years, and is usually a senile involution; hence thrombosis increases in frequency with increasing years. Sometimes the senility is presenility, in which case it is likely to be a heritage from one's ancestry. Sometimes the senile changes are early induced, Oppenheim affirming, for example, that psychic overexertion, or neurasthenia, or a traumatic neurosis, may lead to them.

Of the *intoxications* causing atheroma and thrombosis, lead and alcohol poisoning hold foremost rank. Illuminating gas poisoning and the autotoxins resulting from extensive cutaneous burns may produce degeneration of the endothelium of an artery, unlike atheroma in that it is acute and not chronic, which may be attended with the formation of parietal thrombi followed by arterial occlusion. Possibly some marantic thrombi belong to the same category, being caused by autotoxemia.

Of the *infections,* syphilis is *facile princeps.* I cannot too much exaggerate the importance of this venereal disease as a cause of thrombotic hemiplegia, the number of cases of apoplexy between the ages of 25 and 45 really due to syphilis being an exceedingly large percentage of the whole number of cases from all causes occurring in those age limits. Indeed, whenever a hemiplegic, of any age whatever, is known to be a syphilitic, the diagnosis of thrombosis should always be held prominently in mind. Though a syphilitic artery may break, at least nine times out of ten in hemiplegia, the stroke is really due to thrombosis.

Although syphilis is aside from senility the most frequent cause of thrombosis, yet it is not the only infectious disease causing it. In other bacterial diseases toxins only less inimical to the arteries than those of syphilis are formed, notably in influenza, scarlet fever, and typhoid fever, in the order named. In these latter diseases cardiac weakness with lowered blood-pressure is undoubtedly an aiding and abetting factor. In malaria thrombosis has occurred from the packing of immense numbers of infected red blood-corpuscles in the cerebral capillaries, though in this infection cerebral hemorrhage from rupture of capillary vessels occurs much more frequently than thrombosis.

(*b*) It was asserted above that thrombosis might be due to disease of the arterial wall alone, or to such disease in association with increased coagulability of the blood. I must confess ignorance as to definite knowledge concerning such increased coagulability, but I believe that in pregnancy and the puerperal state such increased coagulability exists, and that it is an adjuvant in the production of thrombosis when it occurs at that time. The coagulability of the blood is also said to be increased in some acute infections and in phthisis; and if (as is the rule) atheroma coexists, the formation of thrombi is doubly accounted for.

Exciting causes, determining the onset of thrombosis, embrace all factors tending to reduce the blood-pressure, the vigor of the cardiac contraction, or the rate of the arterial flow. Such delay may be caused by blockade of the cortical arteries from arteriosclerosis of the basal cerebral arteries, or any severe cardiac depressant or sudden cardiac weakness, as from valvular disease or myocarditis; or an atrophic condition of the heart muscle such as is found after some cases of typhoid fever, may so lower the arterial pressure as to bring on thrombosis in an artery already diseased. The relation of thrombosis to blood-pressure is exemplified by the fact that thrombosis as a rule occurs in the night or early morning hours, when the body is at rest, at a time when arterial pressure reaches its lowest ebb.

In conclusion it may be said that the causes of thrombosis are essentially two—senile arterial changes and syphilis. The clinical value of a knowledge of etiology is very great in dealing with hemiplegia, because one may work to the differential diagnosis as between thrombosis, embolism, and hemorrhage, along etiological lines. Given a senile case with marked arteriosclerosis, or given a case in a younger individual with evidence of an acquired syphilis, thrombosis is far more likely than hemorrhage.

II. *Embolism.*—Emboli are masses hurled along an artery until by reason of its diminishing caliber they lodge, and so blockade it, causing softening in the territory beyond. An embolus in an artery with free anastomoses causes no difficulty, but its effects in terminal arteries, such as occur in the brain, are often disastrous. If the emboli are septic they form foci of encephalitis, or small or large abscesses. If the emboli are sterile, they simply cause softening. In this paper septic emboli are not considered, since they are rarely the cause of ordinary apoplexy.

Emboli are derived from one or more of three sources: the arteries, the heart, and the pulmonary veins. In the *arteries* the emboli first exist in most instances as parietal thrombi. Though these as a rule are fairly firmly fastened to the arterial wall, nevertheless they break off at times and become emboli. These thrombotic emboli are liberated in aneurism more frequently than in mere atheroma without arterial dilatation, especially in aneurism of the conus arteriosus, of the aortic arch, or of the innominate and common carotid arteries. A very large series of cases of hemiplegia resulting from emboli dislodged from aneurisms has been reported, so that manipulation of an aneurismal swelling in the territory of the cerebral supply is to be strictly forbidden. Another class of emboli from arteries, not due to parietal thrombi, is that class in which particles from atheromatous vessels or even calcareous concretions from diseased arterial walls form the matrix of the embolus, about which masses of fibrin may or may not be woven.

Emboli from the *heart* are more common than those from arteries. The great majority of cases of cardiac embolism are furnished by mitral stenosis, probably because the vegetations on the mitral valve form more luxuriantly in this than in any other valvular disease. The aortic valves are much less frequently the site of origin of emboli. Emboli also originate as cardiac parietal thrombi in broken compensation in valvular disease, and in myocardial degenerations. Heart aneurisms have furnished a few cases of emboli and resulting apoplexy. In marantic conditions marantic thrombi may form within the heart, become subsequently loosened, and then swept into the brain. As a rule the matrix of an embolus occurring in valvular disease is a piece of the valve or of the vegetations growing upon it, while in myocarditis, broken compensation, cardiac aneurism, and marasmus the matrix is a thrombus.

Emboli from the *pulmonary veins* are rare. Such emboli, originating in the pulmonary area, are swept into the left ventricle through the rapidly widening pulmonary veins, and easily find their way from the left auricle into the brain. Most of such emboli are septic, originating from ulcerative bronchitis, gangrene of the lung, or any process attended with abscess or cavity formation; and they consequently produce secondary abscesses and patches of focal encephalitis in the brain, so that the frequent association of pulmonary and cerebral abscess, often commented upon by clinicians, is an association logically to be expected. Not all pulmonary emboli are septic, however; sterile emboli may come from the lung in the form of pieces of malignant tumors, or echinococcus cysts in pulmonary echinococcus, or even as masses of liver-cells in acute yellow atrophy of the liver, such cells actually making their way through the pulmonary arteries to the pulmonary veins and so to the brain.

Exciting causes leading to the sudden production of embolism are such as will lead to the sudden tearing loose of a fragment of a diseased valve or of a cardiac parietal thrombus. Thus overexertion physically or men-

tally, emotional excitement, anger or grief, or anything making the heart suddenly to leap or jump or palpitate, as great fright, may loosen a thrombus or detach a fragment from a valve. Therefore the exciting causes of hemorrhage and of embolus are identical, and it is unsafe and unscientific to reason that because of some violent emotional shock or some severe physical exertion hemorrhage must be the sole result. Embolism, on the contrary, may be the cause of the hemiplegia. Thus in the puerperium embolism may occur quite as readily as hemorrhage. Sex plays no part as an etiologic factor. Age is of some importance in arriving at a diagnosis as to the etiology of the hemiplegia. Of course embolism may occur at any age, but it is more apt to occur earlier in life than hemorrhage, at the age when acute inflammatory rheumatism is more common. The relationship of embolism to an antecedent chorea is always to be kept in mind.

In conclusion it may be asserted that in every-day practice, in the vast majority of cases of embolism, mitral stenosis is the cause; conversely, if in a given case of hemiplegia mitral stenosis be not present, embolism is not likely, though of course it is not excluded as a cause in any hemiplegia. The presence of mitral stenosis raises a presumption in favor of embolism, but does not make a diagnosis. Of the other causes of embolism, aneurisms and aortic disease rank second and third respectively, the former raising a large and the latter a slight presumption in favor of the diagnosis of embolism. The law of chances is also to be diligently remembered: only one case in ten of hemiplegia is due to embolism.

III. *Hemorrhage.*—If an artery breaks within the brain, that artery was previously diseased. The rupture of a perfectly *sound* cerebral vessel is just as unheard of as a rupture of a perfectly sound vessel in the lung or intestines. It is just as foolish to believe that a healthy artery breaks within the brain as to believe that the hemorrhage from the intestines in typhoid fever comes from a healthy vessel. Hemorrhage *never* takes place from a cerebral vessel, unless that vessel is diseased.

There are three alleged etiologic factors causing cerebral hemorrhage: (1) increased fragility of the arterial wall; (2) a momentary or sustained increase in the vigor of cardiac action; (3) lowered pressure about the wall of an artery by the surrounding brain tissue, because of a loss of its bulk from senile atrophy.

Increased fragility of the artery wall is due in the great majority of cases to miliary aneurism, first described in 1864 by Charcot and Bouchard, who found it in sixty consecutive cases of cerebral hemorrhage. These miliary aneurisms are excrescences on an artery rather than mere fusiform dilatations, usually spherical in form, varying in size from 1/100 to 1/25 of an inch in diameter. They occur in order of frequency upon the arteries of the ganglionic set, of the corpus striatum, especially upon that particular artery known as the artery of hemorrhage or the lenticulostriate artery, upon the arteries of the centrum semiovale, the cerebral cortex, the pons, cerebellum, corpora quadrigemina, and medulla; and it is noteworthy that cerebral hemorrhage occurs in the same location and in the same order as to frequency.

The cause of the miliary aneurisms is unknown. They appear to be more common in men than in women. Heredity undoubtedly plays a very important part because there are families in which cerebral hemorrhage is of frequent occurrence, and others in which it never occurs. Age is of much significance, miliary aneurism and cerebral hemorrhage being rare before forty. The age at which the maximum number of deaths from apoplexy

occur is 57, but this is not the age of greatest expectation of apoplexy, notwithstanding. For example, if a series of one thousand cases of deaths from cerebral hemorrhage is collected, it will be found that the greatest number will fall about opposite the fifty-seventh year in the table; but if the ratio of those dying from cerebral hemorrhage to those dying from all other causes at the age of 57 be computed, and the ratio of those dying at the age of 60 from cerebral hemorrhage to those dying from all other causes at that age, and so on up to the age of 72 years, it will be found that that ratio steadily increases up to the age of 72. Thus of all the people dying at 72, relatively more will die from cerebral hemorrhage than at the age of 60 or of 57. From the age of 72 the ratio of deaths from cerebral hemorrhage to deaths from other causes gradually falls. Practically, then, quite contrary to the usual teaching, cerebral hemorrhage becomes more and more likely in old people up to the age of 72.

The increasing tendency toward hemorrhage with increasing years logically suggests a close connection between miliary aneurism and arteriosclerosis; yet there is no agreement among pathologists as to a real connection between them, many declaring that in those brains where basal arteriosclerosis is marked miliary aneurisms do not occur, and that in those brains, particularly of the young, where miliary aneurisms abound, there is no basal arteriosclerosis whatever. By some the hyaline degeneration of the small cerebral arteries is regarded as analogous with arteriosclerosis; by others it is looked upon as a distinct pathologic process. It is certain that this hyaline degeneration in the thin-walled minute arteries is a cause of miliary aneurisms if not the only one. Some pathologists assert that the miliary aneurism follows an atrophy beginning in the adventitia and later affecting the media. Ultimately all the walls bulge out, and the aneurism is developed. The effect of the so-called habitus apoplecticus upon the development of the miliary aneurism is *nil*. Toxic substances aid such bulgings, notably alcohol, lead, and those autotoxins found in gout. These substances will at once be recognized as important causes of arteriosclerosis. Syphilis, on the other hand, the most potent cause of arteriosclerosis and endarteritis deformans, is rarely if ever a cause of miliary aneurism, and is therefore an exceedingly rare cause of cerebral hemorrhage.

Increased fragility of the vessel wall is caused not only by miliary aneurism, but occurs also in the hemorrhagic diseases, such as purpura hemorrhagica, pernicious anemia, and the so-called hemorrhagic diathesis (which possibly may some day be recognized as a vascular disease upon a toxic basis).

The second factor in the production of cerebral hemorrhage is a momentary or sustained increase in the vigor of the cardiac contraction. Clearly such a factor ranks merely as an *exciting* cause, for if the vessel were not previously diseased, it surely would not rupture.

(*a*) Of the causes momentarily increasing the vigor of the cardiac contraction are sudden overexertion, as in coughing, sneezing, lifting, doing feats of strength, straining at stool, confinement, coitus, etc.; or sudden mental shock, such as fright, anger, joy, sorrow, or any severe emotional disturbance. Although Gowers explains the few cases of cerebral hemorrhage occurring in sleep as due to the impeded return flow of blood from brain to heart in the prone posture, it is quite as likely to suppose that terrifying dreams lead to the cerebral hemorrhage, the very effect of which will necessarily be to wipe out all memory of the dream, if not life itself. A cold bath in an aged person may so shock a heart as to lead to a sudden and violent beating, and

so cause an artery to break. Oppenheim mentions the case of an army officer in whom a prolonged spree was the cause of a fatal hemorrhage in one whose arteries were not absolutely sound.

(*b*) Of the causes permanently increasing the vigor of cardiac contraction, and leading to high arterial tension, are all those associated with marked hypertrophy of the left ventricle. Thus in chronic interstitial nephritis from one-fifth to one-fourth of all cases die from cerebral hemorrhage, Gowers placing the ratio as high as one-third; and lead, besides causing a particular variety of arteriosclerosis, leads to hemorrhage occasionally by reason of the very high arterial tension which it causes.

As to the third factor in the causation of cerebral hemorrhage, a decrease in the supporting pressure of surrounding brain tissue upon the arterial wall, information is so meager as to amount to little more than a hypothesis, or an *a priori* consideration. Clearly such a factor is merely an aiding cause, not even an exciting one. It merely makes it easier for a diseased artery to break. So far as I know no measure of such supporting pressure has ever been taken, and no norm has been established. Doubtless in marked senility with cerebral atrophy such a factor may exist, but it can hardly count for much because such atrophy is apparently larger in the cortex, where hemorrhages are least likely to occur.

The practical conclusion follows: Cerebral hemorrhage never takes place unless the breaking blood-vessel is first diseased; and if it be diseased, an increase in the arterial pressure from momentarily or from permanently increased vigor of the heart action is the exciting cause of the break, such tendency toward rupture being very slightly increased in the aged by atrophy of brain tissue. By the law of chances from 55 to 60 per cent of all cases of cerebral apoplexy are due to hemorrhage.

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PROGNOSIS AND TREATMENT OF GENERAL APOPLEXY.[1]

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A discussion of any portion of the symptom-complex of cerebral apoplexy must necessarily include cerebral hemorrhage, thrombosis, and embolism.

Prognosis.—Hemorrhage is the most dangerous to life. Many patients die in a first attack, many more during a second or third stroke. The size of the ruptured vessel and the situation of the hemorrhage determine the severity of the case. If the pons or the medulla is the seat of the lesion death is almost certain. If the hemorrhage is very profuse, as when a large vessel gives way, it may break into the ventricles or reach the surface of the brain. In either event the prognosis is hopeless. Most cases of apoplexy with fatal termination have been instances of hemorrhage. In cases that survive the direct effects of hemorrhage this has usually come from a small vessel, and in these the outlook for recovery is better than in thrombosis. It can be explained by the fact that most hemorrhages are either cortical, when they occur in the membranes overlying the cortex, or capsular, when they usually take place just outside the internal capsule, and that the motor tracts in many instances are not

[1]Part of a Symposium on Apoplexy read before the Chicago Medical Society May 2, 1906.

destroyed, but suffer merely from compression. With the shrinking of the blood-clot restoration of function in the motor paths may and often does take place even weeks and months after a stroke.

In thrombosis where the paralysis depends upon softening and direct destruction of brain tissue it is quite otherwise. Here the effects are permanent even when the cause giving rise to arterial plugging is a syphilitic endarteritis. This statement needs emphasis because of the prevailing notion among practitioners that all brain accidents caused by syphilis are curable. A complete arterial blockade that persists forty-eight hours produces death of the parts depending for life entirely upon a thrombosed vessel, regardless of underlying conditions. While an attack of apoplexy induced by thrombosis with its gradual onset, preservation of consciousness, and absence of stormy features in most cases, appears less harmful than that of hemorrhage, the prognosis for recovery from paralysis is not as favorable. Besides, the damage to the arteries in thrombosis is more wide-spread. One attack is usually only a signal for the recurrence of a number of arterial accidents.

Embolism offers a more favorable prognosis than either of the other two conditions, except when one of the large capsular arteries has been suddenly plugged; in that event the prognosis is similar to thrombosis in the same location. In many cases of embolism paralysis entirely disappears after days or weeks, because the patient is most often a young individual who has healthy arteries, capable of establishing and maintaining a collateral circulation. Contrast with him the subject of thrombosis whose arteries are thickened and barely able to supply sufficient nutrition to the parts dependent upon them, and we can understand why it is that territorial expansion in the shape of a collateral circulation is here impossible.

Of the three conditions, then, hemorrhage gives the most unfavorable prognosis as regards an individual attack, and for recovery of usefulness of paralyzed limbs embolism gives the best prognosis; hemorrhage comes next and thrombosis last.

Treatment.—Under this caption only guiding principles can be mentioned; details of treatment must be left to individual choice. The management of a case of apoplexy resolves itself into (1) prophylaxis—that is, the prevention of apoplexy; (2) the management of the attack; and (3) the treatment of the paralysis following apoplexy.

1. Under *prophylaxis* we may state in general terms that an individual with arterial disease should so regulate his life that the wear and tear upon his circulatory apparatus is reduced to a minimum. The treatment is practically identical with that of arteriosclerosis and weak heart.

2. *The attack.* As regards *hemorrhage* it is questionable whether surgical or medicinal means are ever capable of arresting it, excepting those few rare cases with positive signs of progressive meningeal or cortical hemorrhage in which surgery has saved lives. Spontaneous arrest of hemorrhage depends upon an equalization of the intracerebral pressure on the one hand and the arterial pressure in front of the torn artery on the other. Both are, as it were, sparring for an opening; if the pressure in the arterial current be the greater, blood will continue to plough up the brain mass until either the ventricles or the surface of the brain have been reached, which usually means a fatality. If, on the other hand, the blood-pressure in the arteries is lowered—as it usually is after a time—the resisting brain mass with the freshly poured out hemorrhagic material offers an effective barrier against the continuance of hemorrhage. The vital indication for treatment is, then, the *lowering* of arterial pressure. To effect this we interdict all kinds of move-

ment, and place the patient in bed with the head slightly raised. A brisk purge of one or two drops of croton oil in sweet oil is dropped upon the tongue, and heat in the form of hot cloths or mustard plasters may be applied to the lower extremities. When the diagnosis of hemorrhage has seemed quite certain, adrenalin hypodermically or by rectum has been tried with benefit. Aconite and veratrum to depress the heart's action are favorite drugs. Venesection has a legitimate place in the treatment of hemorrhage: from twelve to fifteen ounces of blood should be abstracted immediately or within a few hours after the onset of the stroke. It is indicated in plethoric individuals with throbbing carotids and tense and full pulse, cyanosed face, and labored breathing. In many cases we will have to content ourselves with less drastic measures. The term "watchful expectancy," borrowed from our obstetricians, will also apply here. While waiting for developments, several important matters demand our attention. The bladder will need catheterization about once in three or four hours, or else we will have retention and cystitis, with probable death. The patient's posture requires frequent changing in order to prevent hypostatic pneumonia, a complication that sometimes carries off the patient even if he survives the attack. The lungs must be examined within the first twenty-four hours and frequently afterward. If signs of pneumonia are detected the patient should be placed on the opposite healthy side, which is usually the side of the lesion in the brain. This will have the double effect of facilitating respiration and expectoration and will also prevent the clot from gravitating inward toward the ventricles. Another grave danger is "acute bedsore," which occasionally follows cerebral hemorrhage, and which we must endeavor to prevent if possible, as a fatal termination from this cause is common. Prevention here, as elsewhere, is better than cure. This can, in most instances, be effected by scrupulous cleanliness and frequent changes of position. If an abrasion is found, aseptic and antiseptic dressings should be applied and the patient placed upon an air cushion or water-bed. As will be observed, the apoplectic has to run the gauntlet of many an unseen foe, each one in turn ready to demolish him if the other has allowed him to escape. The various complications must, therefore, be constantly borne in mind.

Regarding the feeding of these patients no great anxiety need be felt. They should be given cold milk for the first three or four days whenever they are hungry. If swallowing is impossible milk may be introduced into the stomach by means of a nasal tube.

In *thrombosis* and *embolism* we have directly opposite conditions to those that prevail in hemorrhage. Instead of high blood-pressure with full arteries, there are low blood-pressure, weak heart, and an arterial blockade which causes anemia, and later death of brain tissue. Here it is imperative to make strenuous efforts to drive the blood through a narrow artery or to dislodge, if possible, an embolus from a large-calibered vessel. The head must be lowered so as to permit a freer blood current to the brain, and heart stimulants such as strychnine, strophanthus, and alcohol must be freely used; the diet should be generous, and everything possible must be done to keep the anemic and starving brain from falling a prey to softening. Indecision or measures applied here that fit a case of hemorrhage mean a hastening of permanent paralysis. Judicious treatment, if begun early, before the paralysis has completely developed, may limit the paralysis to a minimum or even cause a return to normal conditions. The arteries should be dilated and the brain flushed by hypodermic injections of nitroglycerin, 1/100 of a grain in brandy every hour for a few doses. Hot drinks

and beer should be administered to raise arterial blood-pressure, and saline infusions appear to be in order.

Whenever a positive diagnosis of the underlying condition in apoplexy cannot be made, to do *too little* is better than to do *too much.* Symptoms should be watched and combated as they arise. There is still enough work left for the practitioner if he attends to bladder, bowels, dietary, strict cleanliness, and prevents complications. One danger that awaits all forms of apoplexy during the first few days is the development of a cerebritis in or about the clot or the softened area. This manifests itself by a sudden rise in temperature, with perhaps convulsions and a recurrence of coma. The treatment will be ice to the head, antipyretics, cool sponging, and laxatives. The prognosis of this complication is extremely grave, and medication seems to be of little value.

3. *The after-treatment of the paralysis* is the same for all forms of apoplectic stroke. Galvanism has been advised, but very few still persist in its use, as it appears to be devoid of benefit. Faradization of muscles seems to be strongly indicated and should be begun early, within a few days after the stroke, or after the symptoms of the attack have subsided. Systematic passive and active exercise of the paretic limbs have the highest indorsement. H. Munk has proven experimentally that passive movements of five minutes' duration twice daily were sufficient to prevent secondary contractures in the paralyzed limbs of animals, while after a discontinuance of passive exercise contractures appeared which did not yield to any amount of passive movement undertaken subsequently. Passive exercises should be begun two or three days after a stroke and be persisted in for months, if results are to be obtained.

In the application of massage and electricity it is important to remember that only the weak muscles need stimulation; the stronger muscles are already too powerful, and, being unopposed, produce the various contractures. Indiscriminate stimulation of muscles is worse than useless. Applications should be made to the extensors of the upper extremity and the external and anterior group of muscles below the knee. The patient should be encouraged to stand and walk as early as the second or third week after the attack. The sickle-gait in hemiplegia can be largely prevented if patients will make an earnest effort to walk properly by constantly sending down voluntary impulses which eventually become automatic, instead of walking in a go-as-you-please fashion.

The use of a splint of cardboard to straighten the overflexed hand and fingers in hemiplegia may occasionally overcome these obstinate contractures.

A splint so shaped as to keep the foot at right angles to the leg is often useful in preventing the contracture of the foot in hyperextension. To be successful, all of these measures must be resorted to very early in the case.

In conclusion, it is necessary to impress upon patients the necessity of avoiding excitement, physical and mental strain, mistakes in diet, alcohol, constipation, and unhygienic living, if they wish to prolong life. By following a strict regimen I have known patients to live fifteen and twenty years after an apoplectic stroke.

100 STATE STREET.

THE GENERAL SYMPTOMS OF APOPLEXY.[1]

BY D'ORSAY HECHT, M.D., CHICAGO,

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I take it that this symposium was not announced for the purpose of exploiting *everything* that is known of apoplexy in *all* its phases. In fact, it would be impossible within the limits to which this paper is necessarily restricted to exhaustively treat of the symptomatology of even one, much less all, of the forms of cerebral "insult" ranged under the term apoplexy. In reflection of this thought a review of the general symptoms will be but little more than fragmentary.

Much of the ample knowledge we possess of apoplectic seizures is antiquated, but by no means obsolete. The earliest writings of Hippocrates, the painstaking observations of Abercrombie, the brilliant studies of Charcot and Bouchard, the admirable description of Watson, and the monographic writings of Monakow have contributed greatly to the literature of the subject.

The term apoplexy was originally intended to convey the idea of sudden and complete coma. *Hemorrhage* into the brain was held to be *the sole cause*. In due course of time, however, pathologic research made it very evident that thrombotic or embolic occlusion of a cerebral vessel could *gradually* obscure or *quickly* destroy consciousness, and then the condition of cerebral softening took rank coequal with that of intracranial hemorrhage as a prolific source of apoplexy.

Admitting occlusive factors then, an apoplectic attack will be referred to as a sudden complete or partial loss of consciousness, generally associated with various degrees of paralysis. In the same category are placed those paralyses occurring *without* an involvement of consciousness.

The symptoms of apoplexy vary in mode of onset and progression with their underlying causal factors, namely, cerebral hemorrhage, thrombosis, or embolism. Uremia and trauma are acknowledged causes of cerebral palsy, but their due consideration would too greatly extend this paper. It would appear from the liberal insertion of differential tables in our modern text-books that the apoplectic syndrome clearly and definitely expresses the *nature* of the damage done to brain substance. Nothing could be further removed from the truth. Dogma here, as elsewhere in medicine, has led to grievous error, and I feel justified in adding that few clinical conditions call for keener discernment, rarer clinical insight, or greater exercise of the critical faculties than that of cerebral apoplexy.

APOPLEXY FROM CEREBRAL HEMORRHAGE.

The Stroke and Status Apoplectica.—Cerebral apoplexy has from the abruptness of the onset been familiarly called a "stroke." It is this "stroke" and the subsequent apoplectic state that merit our immediate consideration. There is no foundation for the belief that thick-necked, plethoric individuals with deeply-red faces are necessarily of "apoplectic habit." At the time of occurrence the patient may have been feeling well; he may have failed to reckon with the sense of fulness in his head, the slight ringing in the ears, traces of nosebleed, disturbed slumber, and disagreeable tingling sensations in the skin. These forebodings more often indicate softening, but may certainly be present in hemorrhage.

[1]Part of a symposium on Apoplexy read at a joint meeting of the Chicago Neurological with the Chicago Medical Society, May 2, 1906.

Does the patient ever experience anything more than these discomforting sensations? Is actual pain, affecting either the muscles or joints, ever alluded to by patients or construed by physicians as a prodrome to the stroke? In 1893, Weir Mitchell in a clinical lecture commented on prehemiplegic pain—prehemiplegic, in the sense that a violent pain antedated the stroke proper by two years. Ferre records the occurrence of antecedent pain in 14 of a series of 126 cases of hemiplegia, and Weisenburg is the most recent contributor to this fact in a report which estimates 17 cases of 109 as having had pains of varying character before the onset of hemiplegia. Of these, violent pains occurred in seven, dull aches in two, and numbness in five instances, and curiously enough the pains occurred on the same side as the subsequently appearing paralysis. The pains were chiefly noted in the muscles and joints of the upper limbs, less often in lower parts, occasionally in the chest and face. Without going deeply into the pathogenesis of such pains, it is well to note that many distinguished observers regard these hemiplegic pains as of undoubted cortical origin. The question is pertinent and has been asked, Does preapoplectic pain in paralyzed parts occur in hemorrhage or thrombosis, or in both? but I am not aware that this query has ever been satisfactorily answered.

The seizure may come upon the patient suddenly while he is walking, causing him to sink heavily to the floor, or in the event of sitting he pitches forward out of his chair, or, remaining seated, his head drops on his chest, and consciousness is abolished.

The "status apoplectica" now supervenes, varying from a few minutes to a few days, and when fully formed is characterized by all or nearly all of the following symptoms: When put to bed it is noticed that the patient is helpless, perhaps altogether motionless, totally oblivious to all that is going on about him—in deep sleep. In this state he fails to respond to ordinary stimuli in the parts paralyzed, but the unaffected members may move on painful irritation. His breathing is slow, sometimes stertorous, most often regular as that of a person in normal sleep, later taking on at times the Cheyne-Stokes type. Inspiration may be wheezy and prolonged, while expiration is attended with a blowing out of one or both cheeks. One is impressed with the fact that respiration has ceased to be a voluntary act and is automatically presided over by the medulla.

The face is flushed or turgid, and bathed in perspiration, and the half-closed eyes, flaccid cheeks, and passive lips render the features expressionless. Raising the eyelids, one finds the pupils most often contracted and rather unresponsive to light. Vomiting is not present as a rule, unless the hemorrhage is of considerable magnitude.

The conjunctival and corneal reflexes are found wanting. The limbs, one or more, all lie limp and motionless; sometimes there is stiffness in them, more often flaccidity; the lifelessness of an extremity is best noted when a leg is drawn up or held up and let go, falling as a dead weight.

Before the patient becomes deeply comatosed he may be in a state of almost continuous bodily unrest. The occasional tossing about from side to side and the movement of the unparalyzed limbs have been widely commented upon by clinicians old and new, but Browning has enlarged upon the well-known fact of this disquietude and made a special form of physical agitation the text of an interesting paper entitled "Apoplectic Motation." The incessant uneasiness, which at times makes it necessary for an attendant to keep the patient covered, is associated with an anxious, distracted expression of countenance.

Browning seeks to emphasize that in meningitis and many other brain states restlessness, great or slight, is a common occurrence, but the exaggerated, even violent, continuous motility of encephalic hemorrhage is not to be confounded with these.

In deep coma all forms of sensibility are abolished.

With the sphincters relaxed, the urine dribbles away involuntarily from an atonically distended bladder, and the bowels evacuate their contents without check.

The pulse is usually hard, full, slow, but may be undisturbed in rhythm and unaltered in character. A pulse indicating high blood-pressure prejudices one in favor of hemorrhage, but such a pulse is frequently encountered in cases in which everything else points toward thrombosis.

General body temperature per rectum shortly after the onset will be found slightly subnormal, and if again taken some hours later in both axillæ it will be found anywhere from 1° to 2° F. higher on the paralyzed side.

On further inspection it will be noticed that the eyes do not occupy a straight, forward position, but are directed steadfastly to one side; the face and eyes are in "conjugate deviation" and look "toward" the hemorrhagic site in the brain.

The superficial and deep reflexes are at the onset of unconsciousness exaggerated, but with deepening coma they diminish and later entirely disappear. The absence on a side of the abdominal skin reflex is in coma a fair sign favoring apoplexy. Although I shall refer to the Babinski "toe sign" later in consideration of the permanent paralytic state, I wish at this juncture to comment on its *early* appearance in the apoplectic syndrome. Weisenburg has observed the "toe sign" once within twelve hours and again within twenty-four hours after onset of coma. My personal observation of its appearance within a few hours after onset of the stroke is shared by others, some of whom have seen it even in the first hour of unconsciousness. Walton and Paul in a series of 200 cases of hemiplegia and diplegia, old and new, comment on its *early* appearance thus: "This reflex is often the earliest to appear in pyramidal tract disease, *e.g.*, at the onset of a hemiplegic attack *before* the establishment of the exaggerated knee-jerk and ankle clonus; it may *persist* during a period when other reflexes are absent, *e.g.*, when knee-jerk and ankle clonus are wanting on account of ankylosis, contracture, and muscular wasting in long-standing diplegia or of degenerative sequences, as in combined system disease. This reflex furnishes therefore a *most important practical aid in diagnosis.*"

When two or three days of the apoplectic state supervenes without complications the danger period recedes and the next four to ten days may pave the way to improvement and the possibility of recovery. Within three days, if the patient is going to recover, he slowly awakens, opens his eyes, and may yawn considerably; the confused look and indistinct mutterings suggest a sort of drunken stupor. There is still a decided lack of orientation, and a mild muttering delirium may prevail. Gradually better attempts at speech are made; there is better play of facial expression, although the in-and-out blowing of the cheeks continues; orientation is more and more improved, and it may be said that the patient's consciousness is restored.

The pulse becomes rapid, softer, and more regular, the body temperature undergoes a gradual rise from subnormal to a little above normal, pains and painful sensations appear in the paralytic parts, faint twitchings are noticed in the extremities, and a sense of head pain and head pressure is most annoying. By this time the patient may be able to swallow; his

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pupils react; the deep reflexes return with abnormal briskness, but speech if involved will be impaired for a longer period. With the recession of coma, and a partial return of normal vital function, the remnant of the "insult" comes to the forefront in the shape of a paralysis, monoplegic, hemiplegic, or paraplegic in type. This then is the quick sequence of clinical events in those recovering from cerebral apoplexy of hemorrhagic origin.

If on the fourth or fifth day of the apoplectic state the pendulum swings toward dissolulution (rather than recovery), and in cases of grave hemorrhage this is the more likely outcome, the patient's temperature ascends to 102° and 103° F. Coma returns and deepens, involuntaries occur, and there is great bodily restlessness, difficulty in swallowing, Cheyne-Stokes respiration, perhaps complicating pneumonia, and death.

Status Paralytica (The Hemiplegic State).—When the patient has survived the stroke and apoplectic state, a permanent disability varying in degree from light paresis to complete hemiplegia is the inevitable termination. The postplegic state has been too often and too well described to require adequate presentment here; however, to approximate completeness, I venture a brief résumé with some addenda.

The power to stand and even walk a little is given the patient in most instances some six or eight weeks after the apoplectic onset. The paralysis recedes first from the lower extremities, then from the face, leaving no greater distortion perhaps than a slight drooping at one angle of the mouth, while the tongue protrudes almost straight. The arm recovers last and least. The flexors are everywhere better preserved than the extensors, and this inequality plus myotatic irritability, transient rigidity, and secondary contracture gives rise to the familiar deformities of this state. The "sickle gait," the flexed forearm held adducted to the body with fingers drawn into the palm, the reddened, or cyanosed, cold hands, and the occasionally moderately edematous distal paralyzed parts are conditions seldom overlooked in hemiplegia.

For many years all authors have been agreed on the point that the deep reflexes in the postplegic state are much exaggerated. Since 1896 some new reflexes have been discovered, of which a few have been assiduously studied in connection with lesions affecting the upper set of motor neurons and become incorporated in the best neurologic literature. Since hemiplegia is an expression of upper neuron disease, mention of a few of these now well-confirmed reflexes is, I believe, not without practical interest to all seeing this class of cases.

Since Babinski in 1896 alluded for the first time to an extension of the toes, especially of the great toe, in reflex response to plantar irritation, in cases of pyramidal tract disease, this sign has become known as "Babinski's sign," and as a diagnostic criterion has taken every high rank. Walton and Paul noted the sign as positively present in about 70 per cent of hemiplegics and diplegics (and in approximately the same percentage of cases with disease involving the pyramidal tract in the spinal cord).

Closely resembling the Babinski in response is the Oppenheim reflex, first communicated in 1902, and since then quite often elicited in spastic paraplegia and chronic *hemiparetic* or *hemiplegic* states. The Oppenheim reflex is produced by stroking with the handle of a percussion hammer or other blunt object along the inner aspect of the leg below the knee at the posterior border of the tibia. The normal response is flexion of the toes; the response in disease is one of extension and spreading of all the toes with abduction of the foot.

In chronic hemiplegia I have noted in several instances the Babinski and Oppenheim signs jointly present, but I have never seen in the same case an Oppenheim sign present and the Babinski absent, therefore I cannot from personal experience in instances of hemiplegia support Oppenheim's contention that his sign is often present when Babinski's is not. In the past week, however, a case of spastic paraplegia came to my notice at the Northwestern University clinic, in which an Oppenheim was readily demonstrated and the Babinski was negative. (For consideration of other reflex phenomena see foot-note.[1])

After this digression may I be permitted a single reference to the various disorders of movement following late in the wake of apoplexy? The so-called athetoid and associated movements have received frequent mention, and some authors have described what they thought were choreiform movements and referred to them in terms of posthemiplegic chorea, but the weight of authority is against the use of a special term, such as that for a symptom so very rarely seen. Ankle clonus is of common occurrence.

Much has been said and written of the nutritional state, the tone of the muscles in hemiplegia, but it has never been customary to regard genuine atrophy as a qualifying sign of upper neuron paralysis. Since we are disposed to place the trophic centers for muscles in the spinal cord, a part not necessarily affected in the disease of the brain, we have come to *think of cerebral muscular atrophy* as a very rare, well-nigh impossible, and not satisfactorily explainable phenomenon.

A slight secondary wasting of muscles from disuse has always been conceded. Although the why and wherefore for genuine atrophy is still very much of a mystery, a new conviction has sprung up amongst some of the best clinicians, who hold that muscular wasting is no longer an accident of but an incident to hemiplegia. Oppenheim, Von Monakow, Marinesco, Steiner, Quincke, Eisenlohr, have favored this view, and Weisenburg in a review of his 160 adult cases found *some degree of atrophy present in every instance.* He adds that it may come on early after the onset and again not for many months. Without wishing to obtrude personal experience I have in mind a case of cerebral apoplexy probably hemorrhagic in an adult negro, who in the postplegic state presented a most distinct and high degree of genuine hemiatrophy affecting all the trunk muscles and extremities on the paralyzed side. The atrophy usually presents first in the small muscles of the hand, or those of the shoulder group.

Joint affections in hemiplegia are indeed very rare, although Marie has recorded arthropathies.

Very many hemiplegics are the victims of pain, pain of central origin, so-called posthemiplegic pain. Sensory disturbances in every gradation, from tingling, numbness, soreness, and aching, to severe, sharp, shooting pains, are complained of by these patients. There seems to be no special localization, although the favorite sites are in the upper extremities radiating from shoulder to hand, and in the lower limbs from the knees downward.

In refutation of a view erroneously held by

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[1]Not more than a year ago Gordon, of Philadelphia, recorded an interesting phenomenon in cases of upper motor neuron disease, which is now associated with his name and called the Gordon reflex. It is, strictly speaking, a paradoxic flexor reflex, and is supposed to have a diagnostic value equaling that of the Babinski. Placing the patient's feet on a chair, the reflex is elicited by having the examiner (always standing on the outer side of the patient) place his hand on the inner side of the tibia and then exert deep pressure on the calf muscles; the great toe or all the toes respond to this maneuver by extending. By deep pressure on flexor muscles there is a response from the extensor, hence the use of the term paradoxic flexor reflex.

Strumpell I believe, in 1902, published a paper in which Strumpell's tibialis phenomenon, viz., a contraction of the —Strumpell's tibialis phenomenon, viz., a contraction of the tibialis anticus when the thigh is flexed voluntarily on the trunk. The author construed the presence of this sign to mean organic disease of the brain or spinal cord, especially of the pyramidal tract. It at first gave promise of diagnostic value, but subsequent experience has proven it to be disappointing.

many that cerebral hemorrhage can have but *one* form of onset, viz., the apoplectiform, I wish to call your attention to apoplexia progressiva hemorrhagica.

Apoplexia Cerebralis Progressiva (Ingravescent Apoplexy).—Trousseau is largely responsible for the dictum that in the presence of preserved consciousness at the onset of an apoplectic attack, cerebral hemorrhage is not to be thought of. A search of the literature, however, brings to light any number of cases of proven hemorrhagic apoplexy, beginning with only the slightest invasion of the sensorium, moderately progressing toward deep coma. These are instances of ingravescent apoplexy. Prodromes similar in all respects to those that precede thrombotic occlusion have been known to antedate all other symptoms for several days, when drowsiness would appear, paving the way for stupor, and eventuating in coma. A large hemorrhage actually inundating the ventricles has frequently presented progressive symptoms.

In cases of this kind the autopsy has as a rule revealed the presence of atheromatous change in some of the vessels and aneurismal dilatations in others; but a large clot of fresh hemorrhage found in a ventricle was surely the cause of death—not, however, of sudden death. In this connection a statistical paper by A. Ernest Jones in one of the last numbers of *Brain,* vol. 28, 1905, is most interesting.

Amongst other problems he has investigated the subject of the loss of consciousness in encephalic vascular lesions, occurring at or within a short time of the period of onset. At the outset he states that Todd, Lancereaux, Nothnagel, Monakow, and others have advanced the generally accepted idea that occluding lesions cause loss of consciousness less frequently than hemorrhage. This comment is, we all believe, in the main true, but in the light of the following statistics of proven cases it should be liberally discounted. Jones's statistics of cases of hemiplegia that died in University College Hospital during a period of sixty-five years are as follows:

	No. of cases.	Percentage with loss of consciousness.
Ventricular hemorrhage	55	85.5
Non-ventricular hemorrhage	49	69.4
Thrombosis	22	45.5
Embolus	13	46.1

Four cases showed post-mortem that blood had for some time invaded the ventricles with consciousness retained to the end.

From the above table it will be seen that even ventricular hemorrhage, which most often is secondary, can occur *without* loss of consciousness. Your attention is further called to the *initial loss of consciousness* recorded in *one-half of the thrombotic cases* and in three-fourths of the hemorrhagic cases.

Experienced clinicians the world over will no doubt support Jones in his just conclusions that "on the one hand there is a large group, certainly more extensive than shown in the table, of *cerebral hemorrhage* cases *having the onset typical of thrombosis, and on the other there is a large group of thrombosis cases, the onset of which is apoplectiform.*"

In the writing of a text-book it may be pardonable for an author to give a conspicuous symptom its very broadest interpretation, but immediately this is done an opportunity is given the average reader to seize upon a point of *only fair* import and so *falsely* apply it as to controvert the diagnosis and by illogical therapy endanger the patient.

There is need, therefore, to discourage this growing tendency on the part of the many to elevate one symptom (or even a group) to the dignity of an *absolute instead of a differential diagnostic criterion.*

Apoplexy from Cerebral Embolus.—The "apoplectic stroke" resulting from an embolus

resembles closely in point of stormy onset that provoked by hemorrhage, but the *ensuing* symptoms bespeak a more "irritated" state of the brain. Convulsions, fibrillary twitchings, tonic spasms, and conjugate deviation are more conspicuously in evidence.

Essential prodromes are from the very nature of the lesion lacking. So long as the vegetating excrescence of plug-like form keeps out of the blood-stream it does no harm, but its lodgment in the lumen of a narrow vessel precipitates unconsciousness, *deep from the first, but by far more brief* than that attending hemorrhage. The pulse-rate is normal and sometimes irregular, but very seldom slow and bounding, and the general aspect of the apoplectic state harmonizes with that of hemorrhage. When the acute symptoms have subsided the focal manifestations come regularly and well-defined into the clinical foreground.

In a very few atypical instances *emboli* have been demonstrated *without* disturbances of consciousness. Convulsive seizures may alone inaugurate the attack with quickly following hemiplegia, hemianesthesia, and motor aphasia. Cases of embolus have also been reported with practically no paralytic symptoms, but instead mental confusion, delirium, and mild aphasias.

The knowledge of a preëxistent cardiac lesion with its vegetating plug is after all the best diagnostic criterion of cerebral embolus. This factor disallowed, the chance for error is great, although all the other findings may be ever so distinctive and distinguishing. Autopsic revelations, hideous though they be, must not be lost sight of.

Apoplexy from Cerebral Thrombosis.—With atheroma and syphilitic disease as the precursors of slow thrombus formation, it is easy to conceive of *premonitory symptoms as the rule* in cerebral thrombosis. As Gowers has aptly put it, "their significance is more in their presence than their absence." This is especially so in cases of frankly syphilitic origin, in which the advance toward total endarteritic occlusion is especially slow. A *progressive onset,* then, is typical of cerebral thrombosis.

Warning comes to the patient in the form of headaches, vertigo, giddy spells, and transitory motor weakness. I speak of "weakness" here not as a subjective sensation, equivalent to fatigue. I refer to it as an actual deficit in the dynamic power of a muscle or group of muscles, of which loss both the patient and physician are aware. It is evident perhaps only for a few minutes or hours, and expresses itself in a clumsiness of the hands, their awkwardness, and tendency to drop things. Stumbling of the feet or slight dragging of a leg is often noted. Transitory at first, these trifling physical infirmities together with other symptoms recur with greater frequency and intensity, and, by becoming more and more protracted, so distress the individual that they can no longer be regarded as mere spells, but attain to the dignity of *preapoplectic periods.* By a thorough understanding of these "periods," the *kind of large attack* that follows may be conjectured. Patients now feel a sense of numbness come over them, and formication is noted in the hands or arms. They say they "feel pale" and show anxiety. Their apprehensions seem the more well-founded since an occasional thickness of speech is encountered. They are at a loss for a word in conversation, or a word well intended is wrongly applied. The headaches are attended with scintillating scotomata, and twitchings are felt in the muscles.

An extremity feeling asleep or dead is rubbed vigorously, but the paresthesia persists. The fingers may not be able to button the coat so well, and the leg may altogether default in walking. These and a host of bizarre symptoms occur at odd intervals for weeks and

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months, receding and returning, until finally the occlusion has reached such dimensions as to round out an apoplectic state, which eventuates in paralysis, like that resulting from hemorrhage.

Diffuse sclerosis affecting the cerebral vessels may give rise to a train of psychic symptoms of diagnostic import for impending apoplexy. Mental sluggishness and confusion, forgetfulness, falsification of memory, irritability, temper, hypochondriasis, and spasmodic laughter and crying may for some time precede the full-fledged attack.

When the onset of thrombotic apoplexy has been thus gradual, coma is altogether wanting or but slightly present, but *never deepening as in hemorrhage.*

The observations relative to body temperature changes do not obtain here as in hemorrhage. In thrombosis the temperature remains practically unchanged. Dana in his studies of "apoplexy and thermogenesis" cites thirty-eight cases of proven softening with rarely any temperature even in cases fatal on the first day, and he adds that *temperature if present is never high,* rarely more than 101° to 102°. As to unilateral disturbances of temperature, Dana has said that in cases of softening, either of thrombotic or embolic origin, there is practically no elevation on either side, whereas hemorrhage invariably elicits a higher temperature on the paralyzed side.

The pulse in the apoplectic state is as a rule soft, compressible, weak, and rapid, but may in all respects be normal. A slow pulse is rare.

The motor apparatus in thrombosis is involved by easy stages, the monoplegic type of paralysis prevailing. Regional convulsions (Jacksonian type) are common.

The sensory disturbances are functional in manner of distribution and of the paresthetic variety, in contrast to those of hemorrhage, which are anesthetic, largely hemianesthetic. The sensory phenomena are extremely persistent in thrombosis.

The speech anomalies also tend to be permanent.

As for the qualifying symptoms of the paralysis, they are again those of a lesion of the upper motor neuron. The reflexes are brisk, the Babinski toe sign is ordinarily present, the muscles are somewhat atrophied, the electrical reactions of degeneration are absent, and contractures usually develop where there has been much spasticity. In thrombosis, however, the disability remains—there is not that tendency to fair restitution seen in the recovered cases of hemorrhage. Though the insult to the brain is less, the area put out of commission may be greater, with no chance at all for repair.

In conclusion, I beg to refer to an atypical form of cerebral thrombosis. By atypical is meant that form of thrombosis which in contrast to the progressive onset is abrupt, violent, foudroyant, if you will. An endarteritic vessel well-nigh occluded causes a fibrin plug to be deposited at a given narrow point, *suddenly* and completely shutting off the blood column. What follows is *sudden* mental obscuration, *sudden loss of consciousness* (not deep coma), and sudden hemiplegia persistent in character.

In short, there is an *apoplectiform variety of onset in thrombosis,* which fact is only too often lost sight of. I have already emphasized the fact that not every individual in young or middle adult life who develops a slow hemiplegia without loss of consciousness need have a thrombosis, but might have a hemorrhage.

Durand-Fardel is authority for the statement that the apoplectiform type of thrombosis is more commonly seen in older people. In fact, in his twenty-nine "apoplectic" cases, seventeen were above 60 and one below 20. In his proven series of thirty-four progressive

thromboses, twenty-four were below 60 and six were below 20 (see Jones, *Brain*).

Brissaud is of the opinion that a gradual onset is most often seen in senile softening, and a compilation of eighty-five proven cases seems to favor his view.

SUMMARY.

Without reviewing the well-known classic symptoms of apoplexy, I beg to recall some of the controversial points and summarize the more recently acquired facts as follows:

1. So-called "preapoplectic pain" has not been often observed, but is regarded by some as a prodrome of apoplexy.

2. *Excessive* restlessness (apoplectic motation) may have some differential significance in favor of hemorrhage.

3. A pulse indicating high pressure should not *per se* prejudice in favor of hemorrhage, since it is encountered in proven cases of thrombotic apoplexy.

4. Unilateral temperature should receive more clinical consideration than it does, since an elevation makes hemorrhage very probable.

5. The early appearance of the "Babinski toe sign" makes it a most important diagnostic sign during the comatose period, and should be regularly and diligently sought for.

6. In the postplegic state the Babinski toe sign also constitutes the most valuable of the lately acquired reflexes found in the spastic symptom-complex. The Oppenheim and Gordon reflexes when present are also of great value.

7. Excellent authorities agree that cerebral muscular atrophy appears very generally in cases of hemiplegia.

8. Posthemiplegic pains are of frequent occurrence in the paralytic state of apoplexy.

9. Cerebral hemorrhage may have its onset *without sudden loss* of consciousness. Sudden and complete coma should not be regarded as an absolute diagnostic criterion in favor of encephalic hemorrhage, since thrombosis may have an apoplectiform (sudden) onset.

10. The presence of a cardiac lesion is of more than relative though not of absolute value in diagnosing cerebral embolus.

11. Cerebral thrombosis may be ushered in with sudden, complete coma resembling that due to hemorrhage, although its usual onset is slow and invariably preceded by prodromes.

CEREBRAL LOCALIZATION IN APOPLEXY.

BY SYDNEY KUH, M.D.

While but a few years ago the question of cerebral localization of apoplexy was one of academic interest only, it has attained practical importance since the surgeon attempts to treat these troubles with the knife—more often, I am afraid, than conditions warrant surgical interference.

For our purpose it will be necessary to distinguish sharply between two groups of symptoms; those which accompany the development of the apoplectic "stroke," which in part at least are only temporary, and the later ones which represent the more or less permanent loss of function. Of these the former are due in part to the hemorrhage or acute anemia proper, to the sudden and very pronounced increase of intracranial pressure, and to an evanescent interference with the circulation of blood, lymph, and cerebrospinal fluid in parts some distance from the seat of the lesion itself. They do not vary greatly in character, the differences being those of degree rather than of kind. During this early period we are sometimes not even able to tell which side

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of the body is affected. We may find a flaccid paralysis of all four extremities. If the coma be less profound the greater degree of flaccidity existing on one side will indicate where we may reasonably expect permanent palsy. With it we will often see conjugate deviation of head and eyes, lasting but a short time.

When the state of the patient's consciousness permits us to test sensation, one side of the body will usually show more or less anesthesia, and a unilateral superficial loss of reflexes may indicate the side of the lesion even before any difference in the deep reflexes can be made out. Weakness of one facial nerve and hypotonicity of one side of the body are of similar value. Deep coma suggests—but does not prove even that—only one thing, namely, that the lesion is probably not near the cortex. The skin is usually found to be cooler on the paralyzed side at the very beginning, then its temperature rises above that of the other side, to become lower again in the later stages. According to Gowers, hemianopsia is a frequent phenomenon of short duration during the earliest period, as in some disturbance of articulation, most commonly in the form either of dysarthria or bradyarthria. Mellituria, if it occur very early, suggests a lesion near the medulla oblongata.

Within twenty-four to forty-eight hours after the "stroke" has occurred, the permanent focal symptoms usually may be found. It need hardly be mentioned here that we look for the seat of the lesion in that hemisphere of the brain which is opposite to the side of the body which suffers, and in order to avoid constant repetitions only the exceptions to this rule will be mentioned especially. *Lesions within the cortex* and near it are rarely the cause of apoplexy. The symptoms caused by them vary, of course, according to the seat of the focus. They have these points, however, in common: For anatomical reasons the symptoms usually develop rather slowly; unconsciousness is often absent, or else comes on gradually and is only intermittently present. The "seizure" begins with vertigo, diplopia, cephalic sensations, headache, tinnitus, etc., followed by epileptiform twitching in arm, leg, or face, or perhaps an aphasia, and leaving as a permanent symptom only a slight weakness of a monoplegic or diplegic type. If it be in the so-called prefrontal region conjugate deviation of eyes and head toward the affected side, less frequently weakness of the superior rectus or abducens with diplopia, may be seen. Extensive defects, especially if they involve both frontal lobes, cause mental weakness, loss of memory, lack of attention, and childish, silly behavior; if located in the left side are said to give rise to what German authors have called "Witzelsucht"—*i.e.,* a rather unsuccessful tendency to affect wit, and a moral deterioration.

Destruction of a portion or all of the so-called motor area will paralyze that part of the body the movements of which are controlled by that region. As to the extent of this motor area, we have been compelled to modify our views very materially during the last few years. Sherrington and Gruenbaum in a number of publications have made the claim that only the precentral gyrus and the paracentral lobule, not also the postcentral gyrus, were motor in function; and Campbell in his "Histological Studies on the Localization of Cerebral Function" has given convincing proofs of the correctness of this view. It is at least very probable that the postcentral convolution, formerly thought to be motor, controls "common sensation."

Cortical anesthesia, when present, has the same tendency as cortical paralysis—*i.e.,* it is most frequently limited in extent; it is furthermore temporary only in most cases, and usu-

ally dissociated. Inability to localize tactile or painful impressions and loss of muscular sense are often met with.

Let me state again, as I have done once before, that Jacksonian epilepsy may in rare instances be due to lesions affecting parts of the cerebrum other than the cortex, as for instance the centrum ovale, capsula interna, corpus striatum, or thalamus opticus. Once I saw it in an abscess of the cerebellum.

Among the rarer symptoms following cortical lesions, posthemiplegic hemiataxia and hemichorea should be noted.

Perhaps there is no one symptom of cortical origin that is better known than that of motor aphasia. It is commonly supposed to be due to destruction of the foot of the third frontal convolution. If Campbell is correct we must also modify our views as to the location of "Broca's center," which, he claims, is less restricted in area than was generally supposed and extends farther forward.

Other cortical symptoms and the seat of the lesions causing them are briefly as follows: Loss of muscular and stereognostic sense points to involvement of the parietal lobe, motor agraphia to a diseased state of the base of the middle frontal gyrus. Defects in the island of Reil, according to v. Monakow, produce "a mixed form of speech defect, in which to a greater or less extent all the components of speech are involved, and in which signs of motor aphasia will predominate if the lesion be in the anterior division of the insula, and signs of sensory aphasia if in the posterior."

Psychic blindness—*i.e.,* inability to recognize and interpret objects seen, causing difficulty of orientation in space—indicates a large lesion in the parieto-occipital lobe, more probably on the left side.

Alexia, or the inability to comprehend written or printed words, without impairment of vision, suggests the left angular gyrus and second occipital convolution; loss of color perception the posterior end of the lingual lobule. Optical aphasia, which consists in the loss of the ability to name seen objects correctly, although they are recognized, without calling other senses, such as that of touch, into play, points to a lesion in the white substance of the left occipital lobe. The location of auditory conceptions is probably in the superior temporal lobe, though there is still some doubt as to its exact seat. Word-deafness, or inability to comprehend spoken words, though they be heard, has as far as I know never been seen as an isolated symptom. What little clinical evidence there is on the subject also points to the left superior temporal lobe.

Other areas have been designated as the seat of the olfactory and gustatory senses, as the center controlling respiration, the sphincter, surface temperature, etc., but since their value for diagnostic purposes is practically *nil* I shall not bore you by describing them.

When the *internal capsule* is the seat of extensive disease, hemiplegia with hemianesthesia results. The result of smaller lesions may be readily constructed if we remember that the order of representation of movement is from before back, as follows: opening and turning of eyes, opening of mouth, turning of head and eyes simultaneously, turning of head alone, moving of tongue, of angle of mouth, of shoulder, elbow, wrist, fingers, thumb, hip, ankle, knee, hallux, toe; and that this is followed by the tracts for common sensation, hearing, and vision. Of these tracts the motor ones appear to be by far the most vulnerable, hemianesthesia is usually temporary only, hemianopsia both less frequent and less persistent, unilateral deafness quite uncommon. Loss of sensation is not complete—that is, there is hypesthesia rather than anesthesia, unless the case be one of organic hemiplegia with functional hemianesthesia, a combination

which appears to be far from unusual. Severe neuralgiform pain on the paralyzed side is supposed to be a most certain indication of capsular lesion. Other symptoms commonly seen are those due to involvement of the large central ganglia. Of these the *lenticular nucleus* is very frequently affected by apoplexy, and if the lesion be limited to it the result is a typical "stroke," with unconsciousness and hemiplegia, of which the former usually disappears rapidly, the latter slowly. The same symptoms result from disease in the *corpus striatum,* excepting that the facial and hypoglossal usually suffer to a greater degree, as do the muscles of articulation and mastication. If the cause of the apoplexy be located in the *optic thalamus* we again have hemiplegia, difficulty in articulation, frequently hemianesthesia, which is more persistent than that caused by lesions in either the lenticular nucleus or corpus striatum, and may even persist after the hemiplegia has disappeared. The hemiplegia is always transient, if the lesion is limited to the optic thalamus, but hemianopsia with hemianopic reaction of pupil may be permanent. Other persistent symptoms which are met with occasionally are posthemiplegic chorea, athetosis or ataxia, movements resembling the intention tremor of disseminated sclerosis, frequently associated with paresthesiæ, disturbance of muscular sense, hemianesthesia or violent pain in the extremities, trembling of the Parkinson type, loss of mimic expression, spasmodic laughing and crying.

The *corpora quadrigemina* may be the seat of hemorrhages, usually very limited in extent, hence there is no unconsciousness as a rule. Since the pedunculi are almost certain to be involved the result will be hemiplegia with hemianesthesia, often with alternating paralysis of the oculomotor nerve.

Lesions within the *pons* are common; they constitute no less than 10 per cent of all hemorrhages, for instance (v. Monakow). The initial symptoms are as a rule of a very grave character; they may even cause death after a few hours. After they have subsided, unilateral epileptiform attacks are frequent. Trismus is not a rare symptom. The resulting hemiplegia differs more from that in a lesion higher up only in this, that the muscles of the trunk are more distinctly weakened. Alternating paralysis of facial and abducens, early miosis, severe vomiting, and a great mortality (60 per cent, Bode) are characteristic.

Disease of the *medulla oblongata* results in the well-known symptoms of bulbar paralysis —often unilateral—or more frequently in a very rapid fatal termination.

This is a somewhat hasty review of the most important and common localizing symptoms of apoplexy. It demonstrates one thing, if anything, and that is the great uncertainty that still exists when we attempt to determine the exact location of a lesion within the cranial cavity, and that is, I believe, a most important lesson. If, as Dr. Hecht has shown, it is often impossible to state with any degree of certainty whether a case be one of hemorrhage, of thrombosis, or embolism, if furthermore but slight certainty exists as to the seat of that lesion, then any active treatment, unless it be made necessary by an *indicatio vitalis,* means great danger to the patient and a most serious responsibility to the physician or surgeon.

SPECIAL ARTICLES.

THE SOCIAL EVIL.

I. ITS FUNDAMENTAL BASIS.

In spite of the efforts of all nations to suppress or control it, the social evil exists, and according to every indication will continue to exist and increase so long as the present social conditions prevail.

To understand it is to understand human nature, for it finds its beginnings in those sentiments, emotions and passions, inherent in every human breast, upon the gratification of which depend not only the joy of life, but the very life itself.

Desire, conquest, and the resulting satisfaction make up a great part of life, whether intellectual, physical, or sexual. Sexual desire and conquest are fundamental vital impulses, the right to gratify which no thoughtful individual can deny. They are shared in common by every sensate thing, and their evolution presents the most interesting adaptations to the individual peculiarities and requirements of the animal.

Man is an animal—the product of evolution, physical, intellectual, social, and moral. In the course of development his progress has been imperfect. Physically he retains vestiges of useless organs whose presence is fraught with disadvantage and danger, because they frequently become the starting-point of morbid changes resulting in suffering and even death. Of these the vermiform appendix is the most familiar example. In his intellectual development he has retained many characteristics of ancestral forms, so that his inherited appetites and tendencies at times dominate his judgment. In the social development we find the greatest incongruities, for here we have the opinions of the majority determining rules of conduct for all, so that in every social organization there must be a dissatisfied minority at variance with the popular mode, and more willing to evade it than to conform to it. Social order is made up of expedients based upon experience or upon deductions from ethical considerations. Its object is the good of the many at the sacrifice of the few. It is an artificial, though undoubtedly a necessary, state of existence, but in it there are always the few who are being sacrificed, and this must never be lost sight of in analyzing the factors involved in such a problem as that which has to do with the social evil.

Moral evolution, which has already been alluded to as resulting in the ethical foundation of social order, is probably the newest and least developed of man's characteristics. It has to do with the conduct of one individual toward his fellows, and toward himself. The natural tendency of the lower animal is to look out for himself; among men there is confused with this inherited and diminishing tendency an increasing tendency to look out for the welfare of others.

Throughout the animate world there is a law known as "conformity to type," whose operation determines that animals of the same species shall maintain their essential characteristics. Man is not exempt from the law, though the development of his higher faculties, especially the moral sense, and the conditions under which he exists at present enable a greater number of variations from what may be assumed to be the standard type to be appreciated than can be detected among the lower animals.

In most of our moralizing we are attentive to the general conformity to type

and inattentive to the divergences. We are familiar with the physical dissimilarities of our kind, and conscious that the individual is not responsible for them. We do not expect men to be of equal stature and weight, to have hair and eyes of uniform color, and to be equally able to perform physical labor. We know that the perceptive faculties of some are acute and those of others dull, and we have learned that color-blindness cannot be helped, and that careful examination of the color-perception must be made of all cases in which, as in locomotive engineers, this faculty must be called into activity in the recognition of signal lights, etc. We know, too, that all individuals are not equally emotional and do not behave with equal composure or self-control in danger or in sudden emergencies. Yet although we recognize these truths, we have not become sufficiently familiar with them as unavoidable divergences from the average type, to be willing to condone hypochondriacs or forgive cowards or overlook stupidity. We know, though we are loath to admit it, that all are not equally endowed with intelligence, and we recognize the ability of one man to solve problems in mathematics and metaphysics, whose very meaning may be obscure to another. Familiarity with them has made us inattentive to mediocre grades of intelligence, and we recognize the imbecile of whom nothing can be expected and the prodigy whose ability seems to have no limits, forgetting that between them is an unbroken chain of graduated links.

We find, too, in the intellectual life that tastes differ as much as ability. One is by nature a poet and feels and expresses sentiments unknown to another.

In ethics the same divergences hold good, and one man seems immune to any amount of temptation under which his weaker brother inevitably falls because he cannot help it.

So there is in every aspect of life a certain average or standard that characterizes the species, about which in every direction there are divergences or variations that only become abnormal or pathological when so remote from the type as to make the individual conspicuous among his fellows or a source of danger to them.

These facts seem to be lost sight of by many moralists, who, taking an abstract view of mankind, would formulate rules of conduct to which all could subscribe if actuated by similar motives, swayed by similar emotions, and acted upon by the same combination of forces, to find in the end that the standards of the different individuals are so lacking in uniformity that only averages can be agreed upon.

There is, in other words, a grand mean of intelligence and morals, on each side of which are extremes in which individuals rise transcendently above or fall miserably below their fellows. The reformers belong to the former class, the criminals to the latter. The former scarcely understand the latter, who in turn do not understand the reformers or their ideals at all.

In the sexual life these general principles hold. Every normal human being inherits the instinct to copulate. It is perhaps the strongest of the instincts, for in many cases it has exceeded the instinct of self-preservation. It must not be mistaken for an instinct to propagate. This is an error into which many domestic and social reformers seem to have fallen, and it leads to inevitable and unfortunate confusion. The instinct that sways the animal world is to copulate, and it is probably the intelligence of the human being alone that has been able to associate copulation with multiplication. Indeed, there are a few tribes of savage peoples still existing who are innocent of the relation of copulation to multiplication, who legitimize the former by marriage, but believe the latter to be the result of the posses-

sion of the female by a disembodied spirit, who entering into her causes the growth and birth of a child.

Among men the instinct to copulate is stronger than the intelligence, and its satisfaction the greatest known. History furnishes many notable examples of individuals who have risked all, and lost all, including life itself, in the gratification of this appetite.

The force of this appetite insures the permanence of the species, for in human beings a single performance of the sexual act is not usually followed by conception, and a single offspring is the usual outcome when it does occur, so that the increase in numbers is slow. The act is, therefore, frequently repeated, usually for sensual enjoyment, and conception is rather an accidental than an expected result.

In sexual relations there are averages and standards representing the type of the species, just as in all other phases of existence, but the privacy that surrounds sexual life makes it difficult to determine what the standards are. There are doubtless many individuals whose inclinations are weak and who therefore are content to remain continent. These are more apt to be women than men, but in both sexes there are many individuals to whom continence is no privation. On the other hand a large number of individuals, mostly men, are forever tortured by unquenchable passion and burning desire, and seek indulgence at every opportunity. These divergences are to be found in every community, and sometimes in one family. They all come within the limitations that may be called normal, and are not to be confounded with the sexual perversions, to which reference must be made hereafter.

Now with such divergences as these before us it becomes extremely difficult to establish standards of sexual morals that will be satisfactory, and we will presently see that society has perhaps done wisely in letting these matters work along without interference in cases in which the divergences have not been too wide.

Attempts to regulate sexual life by legal enactments are complicated by several factors, among which are uncertainty as to what constitute normal sexual relations, and that in the perpetration of many of those divergences from the supposed normal there enters the consent of the second party to the crime. Thus when it is stated that such and such sexual indulgences are illicit and hence should be punishable by fine or imprisonment, just as are petty and grand larceny, it must always be remembered that one who by sexual congress detracts from the virtue of another—steals something from her, or defrauds her of that which is of personal and social value—he takes that which in most cases is his for the asking or the paying, so that his partner is party to the crime, and his individual responsibility correspondingly diminished.

Social life is essentially artificial. It is the result of the union of individuals for the common good. In it we see not only the evolution of trades and professions through specialization in certain intellectual lines, but also the surrender of what were originally the rights of the individual for the common good.

Such natural instincts and tendencies as are purely selfish and individual must be suppressed, and only those that are altruistic or inoffensive fostered.

Let us see how this bears upon the sexual relation. In the first place the sexual instincts must not be suppressed, else the community would be reduced in numbers and ultimately extinguished. They must therefore be regulated and subjected to such control as shall sustain this normal function. The legitimate outlet is supposed to be marriage. It is said that the normal instinct is to mate, but we have

already shown that the instinct is to copulate. A study of the arrangements among primitive peoples indicates that among them the marital relation is firm or loose in proportion to their social development. Among the lowest social organizations men and women enter into sexual unions characterized by force on the part of the men, passivity on the part of the women, the bond between them being easily severed at the will of the stronger party. As we ascend the social scale we find the sexual unions made more and more binding, until the forcible theft of women gives rise to purchase, and eventually to unions accompanied by sacerdotal and civil formalities. The higher we ascend, the more complicated becomes the social machinery, with involved property rights and family connections, and the better the general welfare is safeguarded, until in the highest forms of social organization the formality of divorce becomes beset with greater and greater difficulties, and the question is often raised by jurists whether divorce should be legitimized at all.

These more permanent sexual unions are of indisputable advantage in securing to the offspring all of the advantages occurring from close family ties, education, and property inheritance, but they are also the cause of certain evils, because if one is to enter upon a course of life that is to be permanent, and therefore to bring with it certain social and financial obligations, the step must be taken only after careful deliberation, and at a time when the ability of the prospective husband to maintain a wife and family can be looked upon as assured. This postpones the time of marriage and loads every community with a number of sexually perfect individuals of both sexes, possessing normal, and not infrequently excessive, sexual appetites with no legitimate means of gratifying them. As the social problems become complex and the difficulty of making a living and providing for a family increases, this number keeps increasing, and the repression of the normal instincts is in not a few cases followed by morbid development of the appetites. The expected result is reversion to primitive conditions and illicit gratification of the passions. Here we find a new social evil arising, for with illicit indulgence comes the discovery that the sexual appetite can be satisfied without the assumption of the responsibilities of married life, that the pleasures of variety can be added to mere satisfaction, and that this can be done selfishly and economically. It therefore deters many whose inclinations would otherwise be to marry from entering the marital state. Fortunately sentiment and affection counteract much of this evil. Again, this illicit indulgence commonly results in venereal infection, which makes marriage impossible or undesirable, and so further postpones it.

We find therefore that the social evil is the natural outcome of the physical nature of man, his inherited impulses, and the artificial conditions under which he is compelled to live. It is the natural condition made unnatural, inexpedient, and immoral through the social evolution of the race. It is not a disease of society, it is an ancestral legacy modified to correspond with a new environment. Until a certain stage of social development is attained it escapes observation; with the progress of social evolution it increases in conspicuousness. The general progress of society rather tends to increase than diminish it, though other factors to be described, and especially the general moral evolution of society, are at work mitigating it. It is as old as society and is no greater menace to-day than it has always been, though it is sometimes made to appear so by being presented as something new and surprising.

BOOK REVIEWS.

WALTER REED AND YELLOW FEVER. By Howard A. Kelly. McClure, Phillips & Co., New York, 1906.

This little volume of 293 pages is a deserved tribute to the personal merits of one who made one of the greatest medical discoveries. It also furnishes a succinct account of those wonderful investigations which led up to the identification of the mosquito as the sole cause of yellow fever, and made it possible to stamp out this scourge in Cuba, where it had been epidemic for more than 140 years.

Dr. Walter Reed was born September 13, 1851, in Gloucester county, Virginia, and his education was conducted in private schools; later he attended the University of Virginia, graduating from that institution. Singular to say, in his early education he manifested no special interest in science. He entered the university by special dispensation, as he was only 16 years old. He did not finish the course, as he lacked means, but graduated in medicine one year later, probably at the age of 18, as it is said he entered the medical profession four years before the usual time. After an experience in the hospitals of New York he entered the army, and passed the subsequent eighteen years on the frontier. A lively account is given of this part of Dr. Reed's career. His scientific work included the years 1890 to 1899, after his return to Washington.

The main facts regarding the establishment of the mosquito theory of the transmission of yellow fever are already so familiar to the profession that it is hardly necessary to recount them here. But Dr. Kelly has performed an inestimable service in recording the main facts discovered by the yellow fever commission. In discussing the personality of Dr. Reed the author says that his acquaintance with him was but brief, but it made a lasting impression upon him. He says: "The annals of Walter Reed's early years are refreshing in their simplicity. They record a natural healthful life in no wise different from other American boys. Nothing in its circumstances or pursuits marked him out as different from his fellows, and his character was distinguished from theirs not by flashes or premonitions of genius, but by a remarkable uprightness, earnestness of purpose, and tenderness of heart. Neither his youth nor his mature years were characterized by any of those eccentricities which it is often the fashion to consider inseparably associated with genius; indeed, his whole life is a consistent witness to the falsity of the theory which exempts a man of unusual abilities from the laws governing mankind in general on the ground that talent in itself is abnormal. The popular idea that the gifted few are not responsible for their actions because they are themselves a deviation from the normal, and that what are vices in their fellow men are venial errors in them, finds no support in Walter Reed's life. Sanity next to earnest Christian principle was his distinguishing trait."

Attention is called to the absence of a congenial environment during the first forty years of his life, the first portion of which was spent in a quiet Virginia home, and the latter part in the far western frontier. It well illustrates that foreign training is not essential, and those experiments upon which the great discovery was based were characterized by Dr. Welch as models of scientific research. They were methods perfected in the United States.

At the time of preparing this review the June 22d issue of *Science* reaches us with the final report of the Walter Reed Monument Association, of which Dr. W. W. Keen is chairman. They have succeeded in collecting a little over $20,000, though it was hoped to raise $25,000. The committee expresses regret that cities and towns which have been devastated by yellow fever have contributed but $1000 all told to this fund. The sum total received from Cuba has been only $25, and it seemed to the committee that the country from which yellow fever was eradicated after having been continually present for 140 years, and which has had clearly pointed out to it the way in which future epidemics can be avoided, should have made a more substantial acknowledgment to one who made its future commercial prosperity a possibility. A very large proportion of the amount subscribed has been contributed by the medical profession.

CONSUMPTION: ITS RELATION TO MAN AND HIS CIVILIZATION; ITS PREVENTION AND CURE. By John Bessner Huber, A.M., M.D. Philadelphia and London: J. B. Lippincott Co.

This work of 536 pages discusses almost every phase of the tuberculosis problem in relation to civilization. The scope of the work is wider than a medical treatise, as it deals with consumption in its relation to human affairs. Part one deals with the evolution of consumption and discusses the ancestry, present life, and posterity in relation to disease. A short chapter is devoted to the psychic element, the importance of which is recognized not only in the development of the disease but as modifying its course. The specific cause of tuberculosis is taken up in the second part of the work. It also discusses the germ and the theories of immunity. Only

eighteen pages are devoted to this part of the work, hence it is to be looked upon not as complete in itself, but as rounding out the book. The chief interest of the work centers in the sociological problems, in which are discussed the economics, racial peculiarities, overcrowding, occupations, habits, and social customs of the tuberculous. Poverty and alcoholism are carefully studied in relation to the development of the disorder, and in this part of the work those who are interested in public health work will find a vast amount of information. Nearly one-half of the work is devoted to discussing the cure of tuberculosis, together with a description of the various sanatoria.

Not the least important is the chapter on the family physician, upon whom it says must fall the brunt of the fight against tuberculosis. It is urged that every family physician in addition to his general training should become a specialist in the treatment of consumption. He should be ever on his guard to detect the disease in its early stages, and when discovered should lay out a broad plan of treatment, which should include diet, rest, and the open air. He should ponder carefully before sending a patient any great distance from home, and he should have certain knowledge of the region, sanatoria, or other institutions to which he would have a patient go.

Sound doctrine is inculcated in relation to education in limiting the spread of tuberculosis, and it is stated that this should be in the hands of the state. Much space is given to a description of the various charitable organizations and sanatoria for the treatment of tuberculosis, and in an appendix are described the various tents and structures used in the outdoor treatment of that disease. On the whole the work is a valuable contribution to the crusade against tuberculosis.

A Manual of Bacteriology. By Herbert N. Williams, M.D., Professor of Pathology and Bacteriology, Medical Department, University of Buffalo. Revised by B. Meade Bolton, M.D., Expert, Bureau of Animal Industry, Washington, D. C. With 108 illustrations. Fourth Edition, Revised and Enlarged. Philadelphia. P. Blakiston's Son & Co., 1905. Price $1.75.

This little manual, of which nothing but good has been spoken in the past, has had new life infused into it through the coöperation of Dr. B. Meade Bolton, and has now arisen from the position of a sketchy outline for class work to a dignified little text-book, in which a surprising number of facts are presented in a readable form and in a very small space. All of the subjects usually treated are included, as well as a chapter upon the protozoan parasites. It will undoubtedly be popular with students, and many who are already well read upon the subject will find much in it to interest them.

In the chapters upon staining methods and upon culture media only those shown by long experience to be of value are dwelt upon, so that the student is not confused by having to select one from numerous methods described by the author, and the methods and media described are given with sufficient attention to detail to enable any one to follow them. It is much better to give a little well than too much carelessly, and this is one of the books where the little is well done.

Second Annual Report of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis.

This contains an account of the work done by the institute during the year beginning February 1, 1904, and ending February 1, 1905. The second year's work of the institute, like the first, has been carried on in temporary quarters and under difficulties, though the work has been better ordered and more exact. As is well observed in the preface in discussing the general work of the year, it is felt that it has increased value because of the impediments and difficulties encountered, as this has furnished an object-lesson of what can be done under favorable conditions. The amount of work done in the dispensary has been somewhat less than during the first year, not due to lack of material, but more time was given to each patient and better scientific work done. Nine hundred and forty-two of the cases admitted into the dispensary and 198 of those admitted to the hospital were new cases. A study of the dwellings and hygienic surroundings of the persons admitted points to the fact that the house plays an important part in the development of tuberculosis, as did those occupations which require employment indoors, such as housework, mill work, factory work, cigar-making, barbering, bar-tending, sewing, shoe-making, tailoring, waiting, and weaving. A few outdoor occupations showed a high morbidity, particularly those of laborer and driver. These occupations are of a low grade, and poor compensation probably explains the high rate of morbidity. In a general way tuberculosis is closely related to indoor life, hardship, and want.

This volume of 452 pages is a mine of information, dealing with the problems which confront any institution which is working to ameliorate the condition of the tuberculous and to prevent its spread. A large number of autopsies in tuberculous cases are reported *in extenso*, and there are numerous pathological studies dealing with effects of tuberculosis on the various organs. An important work undertaken by the institute was a study of the work done by Maragliano dealing with the specific therapy of tuberculosis and vaccination against the disease. M. P. Ravenel was sent to Maragliano's laboratory to study his work and learn his method. While in Europe he also studied other work in serum therapy. At the same time L. Pearson was

sent to Europe to study immunization work in animals. The conclusion arrived at regarding Maragliano's serum was that a gain in weight occurs as rapidly and to as great an extent in cases not treated by serum as in those treated, which is also true of general improvement, cough, and expectoration. There was no special effect from the serum noted upon the pulse and temperature. In one advanced case the administration of the serum was accompanied by a rapid loss in weight. While the material was somewhat limited from which to draw conclusions, the impression was created that this serum is not indicated in cases of moderate or advanced degree. How far the serum lessens the tendency to relapse or reinfection remains to be proved. Regarding the work on the immunization of animals Pearson has a most favorable report expressing the belief that the immunization of cattle is now so far advanced as to justify the most sanguine expectations. It has been definitely established that cattle may be rendered highly immune to tuberculosis by a process that is not harmful. It remains to develop a practical and safe method of applying the immunity.

Christianity and Sex Problems. By Hugh Northcote, M.A. The F. A. Davis Co., Philadelphia, 1906. Price $2.00.

The writer has discussed from the standpoint of Christianity some of the sex problems which are attracting so much attention of late. He does not neglect scientific and ethnological considerations. His book will be found interesting to those who have studied these subjects, and they will find in it much sound doctrine. He considers such problems as marriage, divorce, venereal disease, and other topics from a scientific as well as a Christian standpoint. Unlike many recent books upon this subject, he does not mistake what is extraneous and accidental for real social disorders, but goes to the center of the matter and inculcates sound doctrine.

Dietetics for Nurses. By Julius Friedenwald, M.D., and John Ruhräh, M.D. Philadelphia and London: W. B. Saunders & Co.

The purpose of this little volume is stated in the preface to meet a need of the training school and of nurses in the preparation of foods. The average textbook on nursing contains too little on the subject, while the larger reference works contain too much. The aim of this book is to give the essentials of dietetics. The physiology of digestion has been briefly reviewed. The various classes of foods and the part they play in nutrition have been considered. The subjects of infant feeding and feeding of the sick have been fully discussed, and a brief outline has been given of the principles involved in the nourishment of patients suffering with the various diseases in which diet plays an important part in the management. Rectal alimentation and the feeding of operative cases have been fully described. Diet lists and instructions have been added which should enable the nurse to comprehend and to intelligently carry out the orders of the physician. The work is well issued by the publishers. The large number of recipes will commend the work to those who are seeking to vary and make attractive the diet of the sick upon correct physiologic lines.

Progressive Medicine. Edited by Hobart Amory Hare, M.D., Assisted by H. R. M. Landis, M.D. No. 2 of Vol. 8, July 1, 1906. Lea Bros. & Co. Price $6.00 per annum.

The current number of this year-book contains 368 pages. The four volumes that are published yearly contain a complete digest of the advances, discoveries, and improvements in medicine. There are 19 contributors, each of whom summarizes the literature for the year. In volume 2 William B. Coley presents a discussion of the operation for inguinal hernia, based largely on the communications of Connell and Ferguson. There is an exhaustive consideration of De Garmo's recent paper reporting 110 operations for the cure of femoral hernia. Edward Milton Foote discusses the surgery of the abdomen exclusive of hernia. John G. Clark describes the advances in gynecology, the leading article being one on carcinoma of the uterus, which contains a very adequate summary of the recent literature. Alfred Stengel has a lengthy summary of the literature dealing with the blood; the remainder of his contribution deals with the various dietetic disorders. Edward Jackson presents a brief summary of the literature on ophthalmology.

The Practical Medicine Series of Year-books. Under the general editorial charge of Gustavus P. Head, M.D. Vol. 3: The Eye, Ear, Nose, and Throat. Chicago, 1906.

Casey A. Wood contributes the abstract of recent progress in ophthalmology. It covers 142 pages and contains the most important papers of the year, giving an outline of what has been accomplished in this department. Otology is discussed by A. H. Andrews. The more important papers abstracted deal with the mastoid and middle ear, and there are a number of miscellaneous papers. G. P. Head discusses the advances in nose and throat, which have been considerable. The volume sustains the reputation for excellence achieved by this valuable series of year-books.

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ABSTRACTS.

THERAPEUTICS.

Seborrheic Dermatitis.—

BLAIR, D. *Caledonian Medical Journal*, vol. vi, No. 9, p. 334, July, 1906.

The writer gives an account of a seborrheic eczema from which he suffered, and which had stimulated in him a lively interest in the present state of our knowledge regarding this affection. Unna almost goes to the length of saying that all eczemas are seborrheic. While most dermatologists do not go this far, it is recognized that disorders in the secretion of the sebaceous follicles will lead to inflammation of the skin. The uncertainty of the relation between seborrhea and eczema has left the matter of treatment in a rather uncertain state, though the views of Unna while not absolutely convincing may yet be accepted provisionally. The most satisfactory way of removing the diseased product from the scalp is a thorough washing with Hebra's soap spirit, composed of saponis mollis four ounces and spiritus vini rect. one ounce. If there is very little irritation the scalp should be washed daily, but if there is much inflammation the intervals should be longer. This alone suffices to cure slight cases. The two drugs which have most influence on seborrhea are sulphur and salicylic acid. These may be applied to the scalp in more concentrated form than to other parts of the body. No inconvenience will be felt from one drachm of sulphur to one ounce of salicylic ointment. When the disease spreads to the skin the itching must immediately be treated. This is the most urgent symptom, and the incessant rubbing and scratching prove disastrous in prolonging and aggravating the condition. Temporary relief is easily secured by heat, dipping the part in hot water. The best lotion for relieving the itching is:

℞ Acidi carbolici .....1 drachm.
Cocain. hydrochlor.....8 grains.
Glycerini .....1 ounce.
Aquæ rosæ, to make.....12 ounces.

The constant application of resinol ointment exercises a marked antipruritic effect. After the more acute symptoms have subsided and the part scales, dilute nitrate of mercury ointment containing five grains of cocaine to one drachm is an excellent application. Powders are useful at all stages of the disorder. They not only protect from external irritation, but by soaking up the evaporated fluid produce a sensation of coolness. They are also excellent for concealing any ointment that is applied to the face. Lotions are so evanescent in their action that they are to be discarded in favor of ointments. In many cases it is desirable to withhold ointments and use pastes or powders instead, as the macerating effect of fat is distinctly bad in some cases.

Adrenalin in Spring Catarrh.—

GRIMSDALE, H. *Ophthalmoscope*, vol. iv, No. 7, p. 380, July 1, 1906.

When the various products of the adrenals were introduced into medicine too much was claimed for them in the treatment of various catarrhal conditions, and they have since fallen into disuse in such states, owing to the fact that they have been looked upon as pure hemostatics. In spring catarrh they have a really specific action, which has been pointed out by a number of observers, but has not become generally known. The treatment of this condition without adrenalin is most unsatisfac-

tory. Even the slighter forms linger for years. The vegetations which affect the conjunctiva are scraped and cauterized until the disease yields or comes to a natural end. In 1901 Perret called attention to the value of adrenalin in this affection. A case is reported of a child in whom the disease was confined to one eye. At first it appeared like an ordinary trachoma. The granulations were excised and the eye treated with a 10-per-cent solution of protargol and frequent bathing with a zinc solution. During the year's treatment there was no improvement in the condition. A solution of adrenalin chloride, one minim of a 1-in-2000 solution, was dropped into the eye three times a day. At the end of two months definite improvement was noted under this treatment, and at the end of six months the eye was found to be well.

Since the treatment of the first cases a number of others have come under observation. One of the most striking was that of a man 24 years of age, who for ten years had suffered from large pericorneal masses which were typical of spring catarrh. The disease was represented in the palpebral conjunctiva by the waxy infiltration without any prominent papillæ. The subjective symptoms were of the usual kind, but not very severe, and it was rather on account of the deformity that he came for relief. He was accustomed to the seasonal alterations, but said that although the symptoms varied in degree the ocular lesions were practically constant. He was given a solution of adrenalin 1 in 2000, and the importance of its steady use was impressed upon him. The solution was used at first three times a day, and after a few weeks every six hours. He was soon convinced that improvement was taking place, and at the end of a year the ocular conjunctiva was practically normal and the waxy infiltration had almost disappeared.

The Hyperemia Treatment of Congested and Inflamed Tissues.—

BRADFORD, E. H. *Boston Medical and Surgical Journal,* vol. cliv, No. 24, p. 671, June 14, 1906.

The treatment by hyperemia has attracted a great deal of attention in Europe. It had a counterpart in the earlier days in counter-irritation and other methods of increasing the supply of blood in a part. With the decadence of humoral pathology a system of treatment directed toward combating congestion by the application of cold and compression became almost universal. Bier claims that the true antiphlogistic condition is not anemia but a hyperemia. The hyperemia treatment is not applicable to all stages of inflammation, but this is probably equally true of the anemia treatment.

Assuming that the hyperemia treatment is sound, discussion may be limited to the method of producing it. The usual methods of employing moist heat do not permit of evaporation or excite perspiration, hence the degree of heat in these methods is not as great as when dry air is employed. Such a method produces an active hyperemia, and in some cases it is found that this is not beneficial. Such cases are commonly helped by a passive hyperemia. By passive hyperemia is meant an increase of the amount of blood in the tissues without increasing the arterial flow. This is accomplished by constricting the limb above the point affected, and can be easiest accomplished by placing an ordinary elastic bandage around the limb and retaining this moderate restriction for a time sufficient to congest the tissues. Practical experience has shown that better results are obtained when this constriction is applied for a comparatively long time under a moderate amount of pressure than when constriction to a great degree is applied for a short time. It is not desirable that the limb should be made cold or that it

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should lose its reddish color. This method should only be applied by the surgeon, and the degree and duration of the constriction are matters of judgment in each individual case. The congestive method may be carried out by a suction apparatus similar to that employed in the old vacuum treatment. When portions of the body cannot be encased in the cylinders, cupping glasses of various shapes can be applied. The suction hyperemia is especially applicable to brawny and septically congested tissues, such as cellulitis, phlegmons, etc. The constriction hyperemia is applicable to the less virulent affections such as tuberculosis, and gonorrheal infections.

The Lenhartz Treatment of Gastric Ulcer.—

HABERMAN, J. V. *Medical Record,* vol. lxix, No. 24, p. 967, June 16, 1906.

The Lenhartz treatment of gastric ulcer is a radical departure from that commonly employed. The usual method consists in enjoining complete rest and no food, followed after a few days by the administration of milk in small quantities and at regular intervals. Lenhartz protests against this starvation regimen, using in place of it a concentrated egg-albumen diet. It is based on the theory that in gastric ulcer there is an excess of hydrochloric acid, and the best method of combining the hydrochloric acid is to give a sufficient quantity of albumen. In employing this method absolute rest in bed is enjoined for at least four weeks. An ice-bag is placed on the stomach and kept there almost continuously for two weeks. On the first day, even when there has been a gastric hemorrhage, the patient receives between 200 and 300 cubic centimeters of iced milk and two to four beaten eggs. At the same time 30 grains of bismuth subnitrate is given two or three times a day. The eggs are beaten entire with a little sugar, and the cup containing them is placed in a dish containing ice so that they remain cold. Under this treatment pain and vomiting rapidly cease. The allowance of milk is increased 100 cubic centimeters daily, and at the same time an additional egg is given, so that at the end of the first week the patient is receiving 800 cubic centimeters of milk and six to eight eggs. No more than one liter of milk a day is allowed. Besides milk and eggs some raw chipped meat is given from the fourth to the eighth day. In the third week quite a mixed diet is tolerated, the meat being given well cooked or lightly broiled. No attention is paid to constipation during the first week, nor in many cases even to the end of the second. After the second week the bowels are moved with small glycerin injections or warm water, and after the third week this is done daily if a movement does not occur spontaneously. The associated anemia is met by the administration of a pill composed of sulphate of iron, calcined magnesia, and glycerin. These pills are given from the sixth to the tenth day of the treatment and are at first macerated before administration. The results in Lenhartz's clinic during the past five years with this method of treatment have been far superior to that given by the Leube cure.

Tuberculin in Treatment of Pulmonary Tuberculosis.—

GRIFFIN, W. A. *Boston Medical and Surgical Journal,* vol. clv, No. 1, p. 6, July 5, 1906.

In 1890 when tuberculin was first announced it raised high hopes, soon to be followed by disappointment. Clinically its utility is still in question, but it has been definitely shown to confer a certain immunity upon animals, and some observers have continued to use it. A great variety of tubercle products have been devised, some of which are still used and others discarded. They all consist of extracts of the tubercle bacillus grown on various

media and obtained in different ways. The old tuberculin of Koch, which is the culture media upon which the bacillus is grown, does not contain all the toxin, and it does contain much that is needless and harmful. When tuberculin was first introduced it was used indiscriminately in too large doses and often in very advanced cases, with the result that many patients were made worse or even lost their lives under its use. The later method of using it is to employ minute doses that do not produce any reaction. A fever chart giving the record of the temperature at intervals of four hours is kept, and as the temperature goes above 99° the previous dose is repeated or even lessened. If any constitutional disturbance arises, or any local irritation in a focus of the disease, the quantity is diminished. It has been shown that patients do better under these small doses. In three cases which were under observation a sufficient length of time to test the value of tuberculin it was found of signal value in two and did no harm in the third case. Both of these patients had been treated by open-air and hygienic methods before the use of the tuberculin.

Adrenalin in the Peritoneal Cavity.—

MARVEL, E. *Therapeutic Gazette,* vol. xxx, No. 6, p. 367, June 15, 1906.

The writer expresses the opinion that adrenalin is useful in preventing peritoneal adhesions where raw surfaces are left after operations. Not only does it contract the blood-vessels of the peritoneum, but it tends to prevent shock. An account is given of an operation which was undertaken for intestinal obstruction which had followed an operation for appendicitis. In the first operation extensive raw surfaces were left which necessitated the second operation, in which there were found adhesions which bound tightly together two folds of intestine. When freed all the separated surfaces were oozing, and the serous covering was detached in seven places, a proliferation occurring at one. It was expected that the adhesions would reform immediately. The exposed surfaces were washed with salt solution and replaced in the abdomen. There was then introduced into the abdomen a quart of normal salt solution carrying one drachm of adrenalin. The patient was severely shocked, but made a rapid recovery. A subsequent operation for femoral hernia gave an opportunity for inspecting the intestines; the adhesions were few and consisted of thin bands. For the past two years the writer has been using adrenalin in the peritoneal cavity where there was acute inflammation or raw surfaces were exposed. The adrenalin is usually diluted with warm normal salt solution: one fluidrachm of the adrenalin to one or two pints of the saline solution.

Epithelioma of the Tongue with Secondary Growths in the Glands of the Neck and the Liver Treated by X-rays.—

KNOX, R. *Lancet,* vol. clxx, No. 25 of vol. i, p. 1755, June 23, 1906.

The interest in this case relates to the apparent arrest of the primary growth and the changes which took place in several enlarged glands in the neck. The first gland to appear in the neck had most of the treatment applied to it, and it showed the most changes. The primary growth in the tongue was influenced by the applications, though being farther removed from the seat of application it did not get as thorough treatment. The fatal termination was due to the metastatic growths in the liver. The patient was seen early in June, 1904, and he consulted for a swelling in the right side of the neck under the angle of the jaw. It was rounded and irregular and very hard. During the progress of the case there were several points of interest developed. The

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disease was well established before treatment was undertaken, and the patient had lost weight. The pain in the neck was relieved by the treatment. The primary growth in the tongue ceased to spread, and the first glandular growth visibly diminished in size after several weeks of treatment. He gained weight and was able to resume work. The histological examination of the tissues made after the patient's death demonstrated that the rays had a direct and favorable influence on the new growth in the tongue and glands.

High-frequency Currents in the Treatment of Skin Growths.—

MANDERS, H. *Archives of the Roentgen Ray*, vol. xi, No. 2, p. 41, July, 1906.

In 1897 Oudin called attention to the effect of high-frequency currents on condylomata, small benign tumors of the skin, and molluscum contagiosum. The same treatment was used on warts and small epitheliomata. The results at that time were not satisfactory, as the apparatus was too weak. Since then an improvement in the strength of the current employed leads Oudin to the belief that the high-frequency spark is the best treatment for small epitheliomata and is preferable to radiotherapy, as it is easier to apply and more constant in its action, the results being more rapid. Regarding the ultimate results, he says that while no definite statement can yet be made, it is safe to assert that they are as good as those treated by *x*-rays.

Oudin uses the apparatus made by Gaiffe with a closed magnetic circuit, the spark of the detonator being only about a centimeter in length. The active electrode is connected to the properly tuned resonator. It consists of a metal cylinder rounded at one extremity and screwed into an insulator handle at the other. In application this handle is held in the right hand with the forefinger in contact with the metal part of the electrode. The left hand of the operator is applied to the skin of the patient near the tumor. When the electrode is brought near and moved over the affected part very fine practically painless sparks pass between them which cause a slight anesthesia of the tissues. After a minute the left hand is removed from the patient, when the sparks become more vivid and more painful. The tissues begin to grow pale, become bloodless and more insensible to pain. The right forefinger is then withdrawn from contact with the electrode, and nothing now remains but to riddle the surface with sparks until it is judged that the cauterization is sufficient. If the application is likely to prove painful cocaine may be employed, if the surface is ulcerated, or injected beneath it where the skin is intact. Under the stream of sparks the tissues become first white, then yellowish, and finally brown; they are replaced by a dry scab which comes off at the end of a few days, leaving a red, smooth surface which quickly heals. The cicatrix left is smooth. The question as to what causes these effects is discussed, and it is asserted that it cannot be due to the heat, which is comparatively insignificant.

Action on Bacteria of Electrical Discharges of High Potential and Rapid Frequency.—

FOULERTON, A. G. R., and KELLAS, A. M. *Lancet*, vol. clxx, No. 20 of vol. i, p. 1383, May 19, 1906.

The writers have made a number of experiments to test the effect of high-frequency currents upon bacteria. They found that when the discharges were sprayed onto a bacterial emulsion through an atmosphere of common air that non-sporing bacteria were destroyed after exposures of from seven to fifteen minutes, and the spore-formers were as a rule destroyed within fifteen minutes. In all the experiments in which a decided bactericidal

effect was observed it appeared that this was due entirely to the action of substances formed as the result of electrical action on the atmosphere in which the discharge occurred, the electrical current not exercising any injurious action on the bacteria itself. They conclude that the beneficial effects of high-frequency currents on lupus and ulcerated surfaces are due entirely to the formation of nitrous and nitric acid by the action of the electrical current on the air. It is in effect bringing bactericidal substances in a nascent and very active condition into contact with the bacteria present in the lesion.

The Treatment of Acute Otitis Media and Mastoiditis by Artificially Induced Hyperemia (Bier's Method).—

KOPETZSKY, S. J. *New York Medical Journal,* vol. lxxxiii, No. 24, p. 1232, June 16, 1906.

The writer has employed Bier's method in six cases, five of which recovered without operation. The patients were put to bed after the performance of a paracentesis, and a rubber band 1½ inches in width was fitted snugly around the neck. The pressure is sufficient to cause a slight cyanosis of the face, but not so tight that pain is felt in the congested region, which should be warm to the touch. The band is kept in position twenty-two hours, and is removed for a period of two hours in each twenty-four. The effect of the treatment is further increased by raising the foot of the bed. Where pus is found over the mastoid region a superficial incision is made and the cavity is not packed. It is found that the tight bandage is well borne after the first few hours. The pain is promptly relieved. Patients with cardiac and kidney trouble and those with diseased arteries are not suitable subjects for the treatment. The writer's conclusions are that the method is applicable in selected cases.

An Explanation of the Effect of the X-ray in Leukemia.—

KLIENEBERGER and ZOEPPRITZ. *Archives of the Roentgen Ray,* vol. xi, No. 2, p. 49, July, 1906.

No more striking effect of the *x*-ray has been observed than the improvement noted in cases of leukemia from irradiation of the spleen. So far the observations have been purely empirical. Leuser and Hellier have studied the action of the *x*-rays on the blood. They found that the Roentgen rays are destructive to the leucocytes both in the circulatory fluids and *in vitro*. Under the influence of the *x*-rays the leucotoxin is formed in quantity directly proportional to the number of leucocytes and to the intensity of the irradiation. This toxin in the early stages of its formation destroys the leucocytes. At a later stage it reacts on the circulatory fluid, setting free certain bodies which confer an immunity against itself. If this theory is correct it will account for the improvement noted in most cases of leukemia treated by the Roentgen rays, and also for the subsequent relapse. So far there is no certain evidence that permanent recovery has taken place under this treatment.

Treatment of Chronic Constipation.—

RICHARDSON, H. *Therapeutic Gazette,* vol. xxx, No. 6, p. 365, June 15, 1906.

In treating chronic constipation the natural stimulant to the bowel is bile. Five grains of glycocholate of soda mass with sufficient quantity of magnesia to act as an excipient is given three times a day, using a purgative if necessary. After taking the capsules for a week the bowels commonly move regularly without the use of other evacuants. The advantages of glycocholate mass are that it is non-toxic and that it is the natural stimulant of intestinal peristalsis. The vegetable purgatives, calomel, etc., act through their toxicity, and

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while the neutral salts are non-toxic they deplete the system. Sodium glycocholate is not a purgative, hence results can only be reached after the end of two or three weeks. Occasionally patients complain of nausea, but this usually disappears after a day or two if the medicine is perseveringly used. It can usually be avoided by taking the capsules two hours after meals.

THERAPEUTIC BREVITIES.

Hand Disinfection.—

H. J. Boldt (*Medical Review of Reviews,* June 25, 1906) discusses at considerable length the various methods of disinfecting the hands that have been heretofore in vogue, and claims that the best method consists in the use of veroform. This is a derivative of formaldehyde, but the objections which obtain in reference to this substance have been overcome. The formaldehyde gas is dissolved in a solution of neutral soap. The formic acid decomposes part of the soap and combines with the alkali, leaving the fatty acid free. By filtration a clear, stable solution of pure formaldehyde in soap is obtained. This soap is an efficacious disinfectant and free from all irritating properties, and may be used on the most sensitive surfaces. In using veroform each hand is scrubbed for five minutes with good soft soap and hot water, which is repeatedly changed. Then each hand is scrubbed for from three to five minutes with a 1.5- to 3-per-cent solution of veroform. This is made by adding two to four fluidrachms of veroform antiseptic to a pint of water, after which the hands may or may not be rinsed with sterile water. When used in this way veroform is the best sterilizer for the hands, and will do more than any other disinfectant under like circumstances. It destroys germs and spores more quickly than any other antiseptic, and will penetrate and kill microbes where no other disinfectant can reach. It does not roughen the hands nor harden the skin, and is unirritating, leaving no unpleasant after-effects.

Relief for Seasickness.—

A. C. Girard (*Journal of the American Medical Association,* June 23, 1906) says that 1/120 grain of atropine sulphate and 1/60 grain of strychnine sulphate hypodermically is an effectual remedy for seasickness. In some persons who resist the action of atropine the dose may have to be repeated once or twice, but usually one injection is sufficient for a whole voyage, apparently overcoming the disturbance until the traveler acquires his "sea legs." Occasionally in a long trip with severe weather the treatment must be repeated. The use of the drugs hypodermically prevents cumulative action, which might happen if repeated doses were given by the mouth. The atropine is said to have a stimulating effect on the cerebral circulation, while the strychnine improves the respiration.

Diphtheria Antitoxin in Chorea.—

B. J. Hamilton (*Medical Record,* June 16, 1906) treated a case of diphtheria in a boy who was subject to chorea about nine years ago. Under full doses of diphtheric antitoxin the choreic symptoms disappeared. He recently attended a young man who suffered from chorea following rheumatism. Delirium developed into a violent mania, and the condition of the patient was very critical. Three thousand units of diphtheria antitoxin was administered, which was followed by a marked amelioration in the choreic movements. After two smaller doses all irregular muscular symptoms subsided, and they have not returned a month after the administration of the antitoxin.

MEDICINE.

Examination of the Spinal Fluid in Dementia Paralytica.—

BROOKS, P. B. *Medical Record,* vol. lxix, No. 6, p. 1048, June 30, 1906.

The writer gives an account of his experiences in examining the cerebrospinal fluid in cases of paralytic dementia. The plan was to withdraw 5 cubic centimeters of the fluid, which was centrifugalized for twenty-five minutes and the fluid decanted, leaving 0.2 centimeter. This fluid with the sediment was then stirred thoroughly with a platinum loop and drops of the mixture placed on slides. With the same pipette the fluid was withdrawn in drops by capillary attraction. In this way the fluid had a uniform dilution and the drops were of practically equal thickness. After drying the drop was stained and examined with the same objective and eyepiece in order that fields of uniform size should be observed. The Jenner method of staining was found to be the most satisfactory. That the cellular estimate made by this method was practically accurate was demonstrated by using a Thoma-Zeiss blood counting chamber with uncentrifugalized fluid. The two methods were found to give practically the same result. From thirty to fifty fields were counted in each case, and the presence of one or more lymphocytes to the field was held to indicate a lymphocytosis. Normal cerebrospinal fluid has one lymphocyte to from five to twenty fields.

Satisfactory examinations of the fluid were made in 29 cases, 13 of which were typical paretics, three probable paretics, and 13 suffered from conditions from which paresis could be excluded. In the 13 typical paretics an abnormal increase in the number of lymphocytes was noted in about 61 per cent. In the three probable paretics there was also a lymphocytosis. Of the 13 cases other than paretics 11, or practically 84 per cent, presented a normal lymphocyte count. Of the two, one gave a history of syphilis some twenty years before, and the other suffered from a syphilitic inflammation of the meninges, which condition was cured by treatment with potassium iodide. The presence of serum albumin in the fluid was variable and bore no relation to the number of lymphocytes present or to the presence or absence of paralytic dementia. It was markedly increased in two cases showing signs of meningeal inflammation, and in a case of dementia paralytica associated with tabes. A copper-reducing substance was found in only one case, a katatonic form of dementia præcox.

In conclusion the author says that it is not possible to make a positive diagnosis of dementia paralytica from the cytologic examination of the spinal fluid, but it is an aid to diagnosis in some doubtful cases. It is frequently of service in other conditions, such as meningeal syphilis. So far as the withdrawal of the fluid is concerned the writer has not observed any untoward results, though it should be done under antiseptic precautions and not more than 5 cubic centimeters removed.

Joint Manifestations in Hemophilia.—

RYERSON, E. W. *Journal of the American Medical Association,* vol. xlvi, No. 25, p. 1927, June 23, 1906.

The possibility of hemophilia should be kept in mind in joint affections of doubtful origin. A history of hemophilia may be difficult to obtain, because many patients if they know of the condition are reluctant to admit it. A hemophilic joint is liable to be mistaken for acute synovitis and intermittent hydrarthrosis. In the former there is usually a history of some injury, and there is local pain and tenderness, the effusion disappearing slowly. Intermittent hydrops is a rare disease characterized by intermittent joint effusions occurring

without antecedent traumatism, and each attack is followed by complete recovery. The various infectious inflammations are more painful and persistent and attended with more constitutional disturbance. In the hemarthrosis associated with the hemorrhagic diseases the accompanying petechia may indicate the cause. In the second stage of a hemophilic joint with thickened capsule, limited motion, and subluxation, tuberculosis may be suggested, but there is an absence of true spasticity, there is no free fluid in the joint, and little or no local tenderness. Arthritis deformans is distinguished by its slow onset, multiple involvement of joints, and the presence of bony or cartilaginous exostoses. In the third stage the clinical picture may resemble that of an old tuberculous joint with complete ankylosis.

Before operating on any old ankylosis in which the hemophilia cannot be positively excluded, a test of the coagulability of the blood should be made. In treating the first stage of this condition aspiration should be done with a fine needle, followed by the injection of adrenalin solution and a bandage for six hours. If aspiration is not employed the joint should be massaged and used freely. There should be no fixation after the first day.

Pretubercular Conditions.—

SHURLY, B. R. *Journal of the American Medical Association*, vol. xlvi, No. 24, p. 1833, June 16, 1906.

The so-called pretubercular stage of phthisis is only a latent unrecognized tuberculosis. A sharp line between the pretubercular and the incipient stages of phthisis cannot be drawn. The pretubercular stage is characterized by a progressive loss of weight accompanied with general malaise and sometimes acceleration of the pulse. When these symptoms are present without other definite signs a latent tuberculosis should be suspected. Chest measurements and vital capacity should then be carefully tested. Special attention is called to the relation of chlorosis and phthisis. There is a fairly constant association of anemia with imperfect chest development and progressive loss of weight. Recognition of these signs as marking the initiation of tuberculosis should lead to a vigorous treatment to restore the nutrition and improve the condition of the blood. The writer recommends the hypodermic administration of iron and arsenic, using the green ammoniated citrate of iron and arsenate of soda. Such a treatment is followed by a prompt gain in the hemoglobin, an increase of 5 to 10 per cent being often noted in a week. Attention is called to the change in pulse noted by Wells and Loomis upon change in the position of the patient, and there is a relative feebleness of arterial pressure. Emphasis is laid on the fact that no single sign is in itself conclusive, but several of them taken together constitute a danger-signal which should lead to prompt treatment. The hypodermic use of the remedies named, associated with pure air, good food, and sensible hygiene, will accomplish a great deal.

Intermittent Gastrosuccorrhea.—

CHAMBERS, G. *Canadian Practitioner and Review*, vol. xxxi, No. 6, p. 299, June, 1906.

This somewhat rare affection of the stomach is characterized by attacks of excessive secretion of gastric juice associated with nausea, vomiting, and pain in the region of the stomach. It is closely related to periodic and cyclic vomiting, migraine, acute attacks or exacerbations of hyperchlorhydria, and the gastric crises of tabes. It is most frequently seen in nervous persons, and often has indiscretions in diet and the excessive use of tobacco as its exciting causes. The attack usually begins suddenly in the early morning hours. There are at first acid eructations, heartburn, nausea, discomfort and pain in the region of the stom-

ach which increases in severity. Vomiting gives relief for a short time, but soon the symptoms recur. The vomitus generally contains particles of food, and is rich in both acids and ferments. The later vomitus may be tinged with bile. Analysis shows that the ejected gastric juice contains hydrochloric acid and ferments, and the secretion of the stomach is continuous in the absence of food. There is usually thirst, and this aggravates the vomiting.

The only distinctive sign of this condition is the periodic continuous flow of gastric juice. In this it differs from the ordinary hyperchlorhydria, in which the symptoms are present during digestion. When the stomach contains no ingesta there is no secretion of gastric juice. Vomiting is not so common in hyperchlorhydria as it is in gastrosuccorrhea. Migraine closely resembles this affection, but the headache is more pronounced and it is frequently unilateral. In migraine there is sometimes the same continuous hypersecretion of the gastric juice. The treatment of the condition should begin with a cleansing of the alimentary tract. The stomach should be thoroughly washed with a weak solution of bicarbonate of sodium. If the stomach-tube is not passed, then hot water should be freely and repeatedly administered. Bicarbonate of soda may be added to the water. No food should be given, and water only in small quantities. If constipation is present, benefit may be derived from a cathartic or an enema.

Throat and Nose in Phthisis.—

BARWELL, H. *Practitioner,* vol. lxxvi, No. 6, p. 775, June, 1906.

The writer offers some very suggestive conclusions in reference to the relation of disease of the upper respiratory tract and tuberculous invasion of the lungs. It is claimed that infection is generally by way of the lymphatics, hence the distinction between food and inhalation infection has little significance. The idea of a direct inhalation of the bacillus does not accord with some of the observed facts regarding the development of phthisis. Experimentally infection can be brought about only by the inhalation of large amounts of spray or dust, and they are pretty evenly distributed in the lungs. The inhalation does not account for those cases in which the bronchial glands are attacked before the lung is involved. When infection occurs through inhalation it must be by the mouth, as a healthy nose frees the air from all organisms. From this point of view the question of nasal disease and obstruction is most important. Bacilli enter the mouth with food and air, and reach the cervical lymphatics through the faucial lymphoid tissue and the tonsils. Diseased tonsils, adenoids, and nasal obstruction are factors which favor the development of pulmonary tuberculosis.

Primary Pneumococcal Arthritis.—

PASTEUR, W., and COURTAULD, L. *Lancet,* vol. clxx, No. 25 of vol. i, p. 1747, June 23, 1906.

The writers come to the following conclusions: (1) Primary pneumococcal arthritis is apparently a rare occurrence in adults. (2) In children it is less uncommon. (3) The path of infection is the blood-stream, to which the organisms gain access through some slight and unnoticed injury. This is in all probability situated in the mouth, nasopharynx, or middle ear, and the relative frequency of this form of arthritis in infants and young children may be connected with their susceptibility to inflammatory conditions in these regions. (4) The infection is usually localized at first in one joint, and may remain so, or it may become generalized. (5) The death-rate in the primary form compares favorably with that of secondary pneumococcal arthritis. This may be accounted for by the usual restriction of infection in the

former, whereas the latter generally implies a more or less pronounced septicemia. (6) It is probable that the records available do not convey an accurate idea of the frequency of this form of arthritis, as many slight cases which recover without surgical interference escape bacteriological examination.

Tick Fever or Rocky Mountain Fever.—

RICKETTS, H. T. *Journal of the American Medical Association,* vol. xlvii, No. 1, p. 33, July 7, 1906.

The writer has a preliminary report on the work which he undertook last spring in identifying the cause of Rocky Mountain spotted fever. It will be remembered that Wilson reported that this fever was due to a piroplasma which was found in the blood, a conclusion that Stiles was not able to confirm. Ricketts was unable to find a parasite in the blood, but he was able to transfer the infection by inoculation to guinea-pigs and to a monkey. The disease in guinea-pigs had characteristic features, and the infection was passed from one to another until the third inoculation, after which the reaction was no longer produced. While the cause of the disease has not been identified it has been definitely shown that it can be transmitted to animals. The relation of the tick to the disease has not been fully cleared up. It is to be hoped that further studies will throw some light on this important matter, as the relation of ticks to some infectious diseases, notably plague, is one of very great interest.

The Etiology of Acute Rheumatism.—

FRISSELL, L. F. *Medical Record,* vol. lxix, No. 19, p. 737, May 12, 1906.

The disease known as rheumatic fever or acute articular rheumatism has for some time been regarded as of bacterial origin. A careful clinical analysis of the pathology and symptomatology of rheumatism would lead one to look beyond the joint affection to gain a clear idea of such a protean disease, attacking the joints oftenest to be sure, but frequently the skin, pleura, and heart. It is probable that the tonsil is a frequent point of entrance of the infection, but no correct conception of the disease can be obtained unless it is regarded as a blood infection. If the hematogenous origin is admitted the localization is easily explained by bacterial embolus or local toxin action.

SURGERY.

The Prevalent Drug Treatment of Surgical Anesthesia.—

CASWELL, B. H. *Boston Medical and Surgical Journal,* vol. cliv, No. 26, p. 733, June 28, 1906.

The writer discusses the effect of anesthetics upon the circulation, the mechanism of shock, and the physiological action of various drugs which have been relied on in the treatment of this condition. Collapse is differentiated from shock and is stated to be only a temporary suspension of the vasoconstrictor center, an illustration of which is furnished by fainting. Shock is spoken of as overstrain and consequent exhaustion of the vasoconstrictor center. The predisposing causes of collapse are practically the same as those of shock, but the direct causes may differ. The symptoms of shock are due to malnutrition of the vital centers following lowered blood-pressure. The skin is cold and pale, the breathing shallow and rapid, the pupils dilated, and the pulse weak and thready. The symptoms of collapse, such as pallor of the skin, weak, rapid pulse, and subnormal temperature, are identical with those of shock. Collapse comes on suddenly, while in shock the symptoms appear gradually. It is usual to have unconsciousness or delirium in collapse, but not in shock. The history is of importance, as determining whether the condition is due to a sudden loss of blood, severe

violence to some highly sensitive organ, or to a trauma extending over some period of time.

The treatment of surgical shock and collapse should be largely prophylactic. As little anesthetic should be given as possible. In certain brain and abnormal cases the operator and the anesthetist should work together, the depth of the narcosis increasing and diminishing as indicated by the operative manipulation. Small amounts of the anesthetic are needed except in abdominal cases, liver and stomach cases, and certain brain and eye cases. If the operator is unconsciously and unnecessarily handling highly organized parts, especially the intestines, the narcosis should be deeper and the operator's attention called to the fact. All are familiar with partial or complete postoperative paralysis of the intestines due to too much handling, even with rubber gloves or gauze, and of the difficulty of overcoming this. Fortunately ear, nose, and throat operators do not have these delicate sensory parts to handle excepting the larynx, as in bronchoscopy. Such cases require but little anesthetic and shock is very rare. The anesthetist should call attention to any unnecessary exposure of the body and to the importance of keeping up the external heat, but not to overdo it. The mental apprehension and fear of the patient should be talked away. A long-continued Trendelenburg position by throwing the abdominal contents against the diaphragm mechanically retards the heart and should be avoided. Crile's method of nerve blocking should be employed when operating on an extremity.

When the shock features decidedly predominate no drug is of any use except possibly adrenalin. Hypodermic stimulants are contraindicated. The whole nitrite group are useless and directly tend to aggravate shock by their vasodilating power. Strychnine is also contraindicated; while it is a vasoconstrictor it acts by stimulating the vasomotor centers which are already exhausted by peripheral impulses. Adrenalin is the only drug to be used in this condition. It should be given with saline solution by intravenous infusion. The preparations of adrenalin are 1-to-1000 solution one part in 200,000 parts of saline solution. It should be given slowly, the temperature of the infusion being from 110° to 115° F. The favorable action of adrenalin in shock is due to the fact that it acts chiefly on the muscles and the local nerve apparatus of the vessels, and not on the vasoconstrictor center, which needs rest. In this way it raises blood-pressure. Salt solution given alone or intravenously under the skin or by rectum is of little or no benefit in cases of shock, as it does not raise the blood-pressure. In collapse drugs may be employed with advantage, because the vasomotor center needs it and can take stimulation so as to bring it to its proper condition. In such cases strychnine is useful and alcohol may not be devoid of effect. Why use drugs in collapse when cold water on the face, inhalation of ammonia, and artificial respiration will do the work as well and quicker? Salt solution is indicated if the collapse is due to loss of blood. When shock and collapse are combined the outlook is unfavorable, but treatment should be along the lines of shock.

The Surgical Treatment of Chronic Indigestion.—

DEAVER, J. B. *New York Medical Journal*, vol lxxxiii, No. 24, p. 1223, June 16, 1906.

Attention is called to the fact that a large number of patients with gastric cancer give a history of previous indigestion. It is certain that pyloric stenosis, gastric cicatrices, and adhesions can only be removed by operative measures. No drug will force food through a contracted pylorus. Gastric lavage is only a temporary measure. Surgery alone offers a certain and permanent cure. Gastric jejunostomy is an operation with a low mortality, and

one which affords an adequate relief of the gastric symptoms. This operation meets the indications in certain cases of proptosis better than the shortening of the gastrohepatic omentum. Cancer of the stomach has been long regarded as necessarily fatal, but this is true only of the advanced cases. Extirpation of a cancerous growth from the stomach before the carcinomatous degeneration has become extensive offers a very favorable prognosis. Where there is only ulceration of the pylorus short-circuiting of the food allows the ulcerating area to heal and prevents the cancerous degeneration.

No cancer of the stomach has ever been cured by medical means, and yet there are numbers of patients who have had cancers cut out of their stomachs and have survived for years. The average duration of life in patients with gastric carcinoma treated by medical means is about twelve months. Pylorectomy or a subtotal gastrectomy gives a duration of from twenty-four to twenty-six months. The problems connected with chronic indigestion can only be worked out by the physician and surgeon together. Many cases of chronic indigestion, gastric, biliary, or appendicular, are really surgical diseases. Those that do not yield within a reasonable time to medical treatment can usually be promptly and permanently cured by operation.

A Case of Fragilitas Ossium.—

Wood, C. M. *Archives of Pediatrics*, 23d year, No. 6, p. 446, June, 1906.

The patient, 15 years of age, comes of healthy parents with no significant hereditary diseases. Since his second year he has been subject to fractures following slight trauma. During the period of thirteen years he has sustained twenty-four fractures. The first one took place when he was two years old, from a slight fall when trying to walk. His development up to that time appeared to be normal. Following that he had fractures averaging about two a year, but becoming less frequent in the last two years. The location of all the fractures is not remembered by the patient or his mother, but they recall one in the thigh, seven of the right leg at about the same location, one of hand, one of toe, and several of the forearm. In all but one there was bony union, the latter, a fracture of the olecranon, being united by fibrous tissue. The fractures which occurred in early childhood were almost painless and caused very little inconvenience, but the last two or three have caused considerable pain. The fractures have been less frequent of late years and the patient seems to be recovering. The patient's general health is excellent.

A Rapid Method in Amputation.—

Branch, C. W. *British Medical Journal*, No. 2371, p. 1339, June 9, 1906.

The writer takes occasion to refer to a recent amputation performed on a man 94 years of age in whom it was necessary to operate rapidly. This method he always uses where rapidity is necessary and where the leg is spare enough to permit of it. The leg is seized with the left hand at the point of section of bone with the thumb to the front. The skin over the tibial surface is drawn forcibly outward, the point of the knife is made to enter at the edge of the tibia, graze the fibula, and emerge as far inward as possible on the back of the leg, and a flap is then cut downward. On releasing the skin in front of the incision it opens inward, so that it is possible to enter the knife and clear the tibia and reach the point of exit behind and cut the internal flap, which should equal the external. A semilunar periosteal flap is cut from the front of the tibia and quickly strapped upward, the bones cleared, and the saw entered first obliquely, then straight in the

usual way, so as to take off the front corner of the tibia. Two acupressure needles are inserted between the bones crosswise, so that the anterior and posterior tibial arteries lie in the opposite angles. The pins wound by a figure-of-eight ligature compress the arteries. Two sural arteries require ligation, but the pins are left in position with the silk protruding from the anterior angle of the wound. The pins are removed about three or four days later. By this method of operation the writer has removed a leg in twenty-one minutes, including chloroform and bandaging. The actual amputation takes two minutes.

The Importance of a Microscopical Examination of All Growths Removed from the Nares.—

ROSENHEIM, S. *Bulletin of the Johns Hopkins Hospital,* vol. xvii, No. 183, p. 181, June, 1906.

Attention is called to the neglect of microscopic examination of tumors removed from the nose. This leads to a failure of early diagnosis, and operation is undertaken only when there is a bulging of the nasal wall or protrusion of the hard or soft palate. These cases are usually worse after operation. By systematically examining all growths from the nose malignant disease would be correctly diagnosed while it may be readily extirpated. If the nature of the growth is also recognized recurrences may be properly dealt with. The writer reports six cases of malignant disease, in two of which the diagnosis of nasal polypi was made, and in one that of a papilloma. In still a third case the tumor was looked upon as a polypoid hypertrophy of the middle turbinate, probably of luetic origin. Reference is made to the infrequency of malignant growths as noted in the text-books, and to the fact that Schmidt believes that benign may be transformed into malignant growths, though it is claimed that no case has yet been published which confirms this conclusion. It is noteworthy that in Watson's series of 150 cases or sarcoma of the nasal passages there were 24 cases in which there was a previous history of polypi.

An Improved Operation for Hemorrhoids.—

PILCHER, L. S. *Brooklyn Medical Journal,* vol. xx, No. 6, p. 189, June, 1906.

The operation proposed is preceded by a divulsion of the sphincter. The mass to be removed is grasped by a ring forceps and the parts at the base are put upon the stretch. A longitudinal incision is then made through the mucous membrane and skin on each side of the cone that is drawn out. The apex of the triangular flap of skin is dissected up from the deeper tissues to the base of the pile, and then into the sulcus produced by this skin elevation and the lateral incisions. A pair of Kocher's hemostatic forceps clamps the narrow pedicle of tissue left. The portion of the pile which protrudes beyond the forceps is then cut off, and a ligature is applied by a needle passed through a fold of mucous membrane which is beyond the point reached by the clamp. When this is tied the main part of the blood-supply of the parts below is cut off. The long end of this ligature is then carried by the needle as a running suture around the mass in the grasp of the clamp from within outward, until all of the tissue grasped by the clamp has been included. The wound in the mucous membrane and skin is then sutured.

Delayed Value of Surgery in Epilepsy.—

SPRATLING, W. P. *New York Medical Journal,* vol. lxxxiii, No. 20, p. 1025, May 19, 1906.

The writer refers to the fact that surgical operations for the relief of epilepsy may be followed by no apparent relief, but that marked improvement may follow in one, two, or three years after the operation. The case of a girl 14 years of age is reported, who had suffered

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from attacks of Jacksonian epilepsy, the seizures running from 120 to 150 a month. Four years ago the involved center was removed, since which time there has been a steady amelioration in the symptoms and an improvement in the condition of the patient. The attacks now number only about 150 each year. In a personal communication to the writer by Dr. Park, of Buffalo, who operated on this case, he said: "I have for many years taught and tried to impress on my students the fact that benefit accrued slowly after all surgical treatment for epilepsy, and that patients must not expect too much at first; that the surgical treatment is only a part of what should be done, and that they need dietetic and other good management as much as ever. I have seen this so often that I regard it as one of the established facts in surgery."

Somnoform Anesthesia.—

PADEN, C. M. *Illinois Medical Journal*, vol. ix, No. 6, p. 595, June, 1906.

This is said to be a valuable anesthetic for all minor operations because of the rapidity of its action and the length of available anesthesia. It can be administered to all patients without special preparation. Its pleasant effects and safety have been demonstrated by a record of over one million anesthesias without a well-authenticated fatality. Its advantages over nitrous oxide gas are shorter time for inducing anesthesia, and the duration is more than three times as long. The writer has discarded his nitrous oxide apparatus entirely.

Bennett's Fracture.—

RUSS, R. *Journal of the American Medical Association*, vol. xlvi, No. 24, p. 1824, June 16, 1906.

The writer directs attention to what has been regarded as a comparatively rare fracture, but it is much more common than has been supposed, and is usually mistaken for a dislocation. It is an oblique fracture of the base of the first metacarpal bone, in which the articulation with the trapezium is detached and the shaft of the bone slips upward and backward, simulating a backward dislocation of the thumb. The writer has observed eight cases during the past year. The recognition of the fracture may be difficult, and is often only confirmed by a radiograph.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

General Convulsions in Early Infancy Induced by the Taking of Food.—

SMITH, E. *British Medical Journal*, No. 2371, p. 1338, June 9, 1906.

Convulsions in early infancy have some bearing upon pyloric obstruction. In infants the alimentary canal is a common seat of irritation. Cases are infrequently met with in which healthy infants are thrown into severe convulsions a few minutes after taking a meal of some simple food. The first case of this kind which came under the writer's observation was that of an infant which had been fed with judgment, but which would fall into a severe convulsion after each meal. The infant was well nourished and was raised upon a mixture of Swiss milk and water. The child would be seemingly perfectly well, and then when fed with an ounce of this mixture would apparently drop into a quiet sleep, to be followed in about two minutes by a twitching of the face, jerking of the limbs, and violent convulsions. This particular patient died in one of the convulsions.

In the last few years the writer has seen four or five other cases of the same kind, but without a fatal termination. Ordinary treatment for the digestion will quickly bring the attacks to a close. All the cases were in hand-fed babies and presented the same characters.

They have all been healthy looking infants, well nourished, apparently strong, and not peevish or fretful, nor were they sufferers from abdominal discomfort or other sign of indigestion. Each after a meal of the simplest food would be thrown into convulsions without any warning. The peculiarity of the cases is a complete absence of any sign of uneasiness between the end of the meal and the beginning of the seizure. The writer believes that these cases throw a strong light upon the mechanism of pyloric obstruction in the new-born infant, and tend to confirm the view that the trouble is a reflex spasm of the pyloric sphincter. The repetition of the contraction determines a hypertrophy of the muscular layers. The signs of obstruction are often absent at birth, and may not appear until an interval of some weeks has elapsed. Such cases as those described are a rather strong argument in favor of the spasmodic theory.

Recent Studies in Measles.—

ROSENBERGER, R. C. *American Medicine*, vol. i, No. 3, p. 139, June, 1906.

The writer briefly reviews the efforts that have been made to identify the cause of measles. Some have found a bacillus in the blood and other bodies variously described. Hektoen definitely determined that the blood in cases of measles does contain a virus which when inoculated will produce a maculopapular eruption, a rise of temperature, and a branny desquamation. The nature of the infection he did not identify. The writer's studies have been made of the contents of blisters formed over the eruption during the early days of the disease. The vesicles were produced by strong ammonia. The serum was collected in sterile capillary glass tubes and examined in the fresh state. A more or less constant hyaline body was found. In size it varied from 1/10 to 1/6 the diameter of a red blood cell. It was generally spheroid, while ovoid or pyriform shapes were also seen. Attached to it was a round or irregular granule of a brownish-black color which was actively motile. In two or three instances flagella were seen, but never more than two. Another hyaline body, also motile, but containing from two to four small motile granules, was occasionally seen. The first described body was seen in 39 out of 41 cases of measles. In the two cases in which it was not found the serum was obtained on the fifth day of the eruption, when it was fading. The body stained with Wright's stain, though poorly. The body should be classed among the cytoryctes. It is not claimed that it is the cause of measles, but its uniform presence in these cases and its absence in other infectious diseases would merit further consideration.

Congenital Hypertrophy of the Pylorus.—

ROB, J. W. *Lancet*, vol. clxx, No. 25 of vol. i, p. 1751, June 23, 1906.

The writer summarizes the symptoms of this condition as expressed by most writers on the subject. From 80 to 85 per cent of the cases are in males. The family history is unimportant. The symptoms do not appear until the baby is about a month old, and then the primary symptom is persistent, intractable, copious, forcible vomiting, which is uninfluenced by diet. No apparent cause for the vomiting exists. The characteristic feature of the vomiting is its forcibleness. It is not frequent and there is no bile in the vomit. There are progressive loss of weight, visible gastric peristalsis, a tumor in the pyloric region, dilatation of the stomach, constipation as a rule, and a normal or subnormal temperature. A case reported by the writer occurred in an infant three weeks old. From the time of its birth it had been doing well. On its twenty-fifth day the child vomited for the first time. The vomiting continued from that time, and

within a week the gastric peristalsis was marked and the emaciation was advanced. For the following months washing of the stomach was done every day, and the feeding was restricted to peptonized milk and water two parts, giving a half-ounce every hour. At the end of five weeks the baby was extremely wasted. The dilatation of the stomach continued for a long time. It easily held six ounces. A pyloric tumor was felt about five weeks after the beginning of the illness. At this time it was decided to give 1/80 of a minim of tincture of opium twenty minutes before each feeding. With this minute dose of opium the effects on the pupil were marked. Under this treatment and the stomach washing there was a continuous gain in weight, and in two or three weeks the vomiting ceased. At the end of two months the fulness in the epigastrium and the peristalsis could no longer be seen.

Suprapubic Hysterotomy as a Means of Diagnosis and Treatment of the Uterus.—

Russell, W. W. *Bulletin of the Johns Hopkins Hospital,* vol. xvii, No. 182, p. 134, May, 1906.

Attention is called to the fact that vaginal exploration even by splitting of the anterior cervical and uterine wall is unsatisfactory in many cases. The procedure employed by the writer is to expose the uterus by an abdominal incision either for purposes of exploration or for other reasons. After the pelvic organs have been examined the uterus is drawn out of the abdominal opening as far as the cervical portion and surrounded by gauze. It is then grasped on both sides by an assistant, who lifts it well up while the operator boldly splits it in the median line on the anterior wall halfway down toward the neck, as well as through the fundus to the posterior surface. The entire thickness of the uterine wall is divided for a distance of two or more centimeters down into the cavity. This exposes the mucous membrane, which can be inspected and the cavity palpated. If the mucous membrane is diseased all involved portions are readily removed. By such method the cornua and the entrance of the tubes can be effectually reached, a procedure which is almost impossible by the cervical route. In this way small polypi have been reached which were not found by previous curetting. The bleeding in this operation is only moderate, and it has not been necessary to put ligatures around the vessels. The wound in the uterus is closed with interrupted catgut sutures passed from the peritoneal surface down to the mucous membrane. These are placed one-half centimeter apart, and between them fine catgut sutures.

Suprapubic hysterotomy is of conspicuous service in cases of persistent uterine hemorrhage which is not controlled by any form of treatment, and in which bimanual palpation of the pelvic organs has given an absolutely negative diagnosis. In not a few instances the mucous membrane will show by microscopical examination a polypoid change, yet thorough and repeated curettings do not stop the irregular bleeding. This is explained by the location of the growths which are in the uterine cornua, and none of the instruments devised will successfully reach these areas. Small submucous and pediculated myomas which do not alter the size or contour of the uterus, but which may be the source of dangerous hemorrhage, are easily detected and removed by this method. Where the abdomen has been opened for some other purpose and no explanation has been found for the uterine hemorrhage, hysterotomy should be employed. No deaths have occurred in the writer's 32 cases notwithstanding that many of them were complicated by other serious abdominal or pelvic disturbances, proving quite conclusively the slight danger attending the operation.

Joint Diseases, Especially Those of Children.—

WILLARD, DE F. *New York Medical Journal,* vol. lxxxiii, No. 25, p. 1269, June 23, 1906.

The writer concludes his article on joint diseases of children with the statement that early diagnosis is the most important of all considerations. A child with any peculiarity of gait or carriage should be examined carefully and all of the clothing be removed. The thought that pain in a single joint in a child means rheumatism should be abandoned. A limp or peculiar gait with rigidity of periarticular muscles in a child always means some form of invasion, probably tuberculous, possibly septic. Tuberculous infections must be treated by immediate and absolute rest with fixation of the joint, and the patient should be kept out-of-doors day and night. A wise conservatism consists in the prompt application of all methods of relief, whether hygienic, mechanical, or surgical. In children conservative management of joint cases usually results in improvement as they have good recuperative power. All septic involvements of joints by the streptococcus, staphylococcus, pneumococcus, or gonococcus should have early and free drainage.

Occipital Posterior Positions.—

PURDY, J. R. *Australasian Medical Gazette,* vol. xxv, No. 5, p. 224, May 21, 1906.

Occipital posterior is the most common and most important abnormality in vertex presentations. Seventy per cent of vertex presentations have the occiput anterior, and in 30 per cent it is posterior. In two per cent of the latter rotation does not take place. The practical point regarding occipital posterior presentations is that there is always delay. The treatment employed should be adapted to the circumstances of the individual case. Rotation, traction, and flexion are all methods of overcoming this condition, but as to which is applied should depend on the circumstances of the individual case. A simple method of rotating has been followed by the writer. The left hand grasps the head at the side and it is rotated into position. Then one blade of the forceps is introduced to hold it in place before the hand is withdrawn. In the American method the hand is passed into the vagina, the head raised gently until the whole surface of the hand can be applied to the forehead, the fingers lying over the face. Then the hand and forearm are rotated with the head until the occiput is well anterior to and if possible to the left of the median line. With this method of rotation if it is not desirable to immediately deliver the body can be rotated with the head, and then the occiput will stay where it is placed. Such a procedure is simple and can be accomplished with safety to the mother and child, and by this means a difficult occipital posterior can be made into an occipital anterior and labor speedily terminated.

Ossification of the Fontanels and Closure of Sutures at Birth a Cause of Difficult Delivery.—

LEAHY-LYNCH, T. *Lancet,* vol. clxx, No. 20 of vol. i, p. 1386, May 19, 1906.

A patient 33 years of age with a vertex presentation completed in the usual time the first stage normally. The membranes were then ruptured, and the patient left a reasonable time to complete the second stage. Failing strength indicated the use of forceps, which were applied under anesthesia. Delivery was accomplished with some difficulty. Upon examination it was found that there was no molding or overlapping of the parietals over the frontal and occipital bones. There was no trace of a posterior fontanel, and a mere depression at the anterior fontanel. All of the cranial sutures were closed. The writer calls attention to the infrequency with which this cause of dystocia is mentioned and also to the difficulty of recognizing it.

FORENSIC MEDICINE AND TOXICOLOGY.

Rules Pertaining to Skill Required of Physicians.—

Journal of the American Medical Association, vol. xlvi, No. 25, p. 1969, June 23, 1906.

The Supreme Court of Appeals of West Virginia holds in Dye *vs.* Corbin in an action for malpractice in which the judgment was in favor of the defendant that the burden is on the plaintiff to prove negligence or want of skill resulting in an injury to the plaintiff. A physician is not required to exercise the highest degree of skill and diligence possible in the treatment of an injury or disease unless he has by special contract agreed to do so. He is only required to exercise such reasonable and ordinary skill and diligence as are exercised by the members of the profession in good standing in similar localities and in the same general line of practice, regard being had to the state of medical science at the time. A physician does not warrant or insure that his treatment will be successful in the absence of special contract to that effect. Failure on the part of physician to effect a cure does not alone establish or raise a presumption of want of skill or negligence on his part. Where a physician exercises ordinary skill and diligence, keeping within recognized and approved methods, he is not liable for the result of a mere mistake of judgment. A physician is liable for the result of an error of judgment when such error is so gross as to be inconsistent with that degree of skill which it is the duty of a physician to possess.

After laying down the general rules the court refers to the evidence of certain physicians who commented on the failure of the defendant to give an anesthetic. They did not claim that this omission had resulted in a bad effect or that the treatment of the ankle was improper. The treatment might have been attended with more pain to the patient because an anesthetic was not administered, but the treatment of the ankle might have been the same with or without an anesthetic. It did not follow that the injury to the ankle was increased or aggravated by failure to give an anesthetic, and such an aggravation of the injury could not be presumed without evidence. It was not shown that it was the duty of the physician to administer an anesthetic, considering the time, locality, and the condition of the patient. In commenting further upon the tests of liability the court said that mere conjecture was not sufficient to sustain liability, and the mere failure to discover a fracture or dislocation does not alone establish or raise a presumption of want of care on his part. The verdict, which was for the physician defendant, was sustained.

PUBLIC HEALTH.

Degeneration of the Myocardium in Hot Climates.—

Brown, W. C. *British Medical Journal,* No. 2373, p. 1462, June 23, 1906.

A peculiar form of degeneration of the cardiac muscle is noted in tropical climates which is characterized by the following symptoms: The patient is commonly sure that there is not much the matter, but says he is tired, sleepless, and disinclined to exertion; he yawns unaccountably, has flushings of the face, and tinglings and itchings in the extremities. There is a vague feeling of uneasiness and apprehension; there is no faintness, dyspnea, cough, or precardiac oppression. Palpitation is absent or slight and felt only after exertion. There is some indigestion, and the feeling of weariness comes on coincidentally with discomfort in the stomach. The patient is thirsty and takes more than his usual quantity of stimulants. The pupils are large and not actively responsive to volitional or reflex

stimuli. The pulse is irregular, but full, soft, and deliberate; the vasomotor system is negative, and there is no hardening of the arteries. The skin is moister and more lax than usual. The temperature is normal, the tongue is clean and gives no indication of any morbid condition. The urine is scanty and loaded with urates, though otherwise normal. The cardiac rhythm is unimpaired, and an occasional flutter or tremor may be detected at the apex. The impulse is softer, perhaps more diffuse than normal, but it is not displaced. The clearness of the sounds is diminished. These symptoms persist for a time, usually the patient becomes little worse, and after an uncomfortable day goes to bed overtired; he is awakened in the night by an anginal attack, followed by sudden death. Contrasted with the commoner forms of myocardial decay the salient features of the disease are the absence of fainting fits, the inconsiderable impairment of the circulation, the vagueness of the physical signs, and the fact that fatal syncope usually supervenes in the absence of unwonted exertion.

The post-mortem appearances are fairly uniform. The heart is somewhat larger than normal and flaccid. There is no dilatation and no endocarditis; there is no dilatation or atheromatous change in the coronary arteries. The myocardium is pale almost to whiteness, soft, and friable. Microscopically the intermuscular connective tissues seem to be swollen, the individual fibers suggesting cloudy swelling. The striæ are hazy and indistinct, and there is occasional rupture and fragmentation. The myocardial lesion seems to be an incident of a general dyscrasia. The liver is small. There is no definite atrophy of the intestines, but their coats are thin and the villi and mucosa are shrunken and deficient in lymphoid tissue. The body fat is normal in quantity, but of irregular disposition. In two necropsies in which a careful examination of all the organs was made no parasites were found, and the blood and bone-marrow were normal.

The writer questions if the disease is in any sense limited to the tropics, as under the term "soft heart" similar conditions have long been noted. There is no definitely associated cause of this form of degeneration, but it seems to be brought on by overexertion in the tropics, especially when the distinction between exercise and fatigue is inadequately realized. If treatment is to be successful in this condition it must be recognized early, while there is a chance of restoration of the involved muscular fibers. Rest in bed is the first essential, and a limited diet should be enjoined. Heart stimulants are to be avoided. Tobacco, which is a heart depressant, must be prohibited. Opium is of special value.

Beriberi or Alcoholic Neuritis.—

TAYLOR, J. S. *Journal of the Association of Military Surgeons,* vol. xviii, No. 6, p. 412, June, 1906.

The writer expresses the belief that a large proportion of the cases of beriberi that have occurred in the army and navy are really cases of alcoholic neuritis. The climatic conditions which prevail in the Philippines render the action of alcohol much more deleterious than in other more favorably situated localities. The majority of the cases occur among officers, who if they use alcohol generally take it regularly, while the enlisted man if addicted to alcoholics commonly receives his when on a debauch, which is followed by a more or less prolonged abstinence. The enlisted man should be relatively the most subject to this disease, as his quarters are frequently poorly lighted and not well aired. The officers that have suffered from this disease have belonged to all grades and performed the most varied duties under dissimilar circumstances. The only constant feature was the use of alcohol in some measure.

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EDITORIAL.

THE FRESH-AIR TREATMENT OF ACUTE RESPIRATORY DISEASES.

It is an accepted dictum that the tuberculous need fresh air, rest, and abundant feeding. The opinion is gaining ground that the same treatment will prove useful in the acute respiratory affections and many chronic conditions. In the *Medical Record* of July 7, 1906, James M. Anders has an article on the fresh-air treatment of pneumonia. His experience has been limited to the observation of five cases, but the results in these are so striking that he is disposed to recommend fresh air in the treatment of the majority of cases. He attributes the improvement noted in these cases to the fact that the air is cold and that it acts as a tonic. There are two other important elements, namely, the amount of moisture in the atmosphere and the variation in temperature. We have repeatedly in these columns referred to the importance of a due amount of moisture in the atmosphere, and have expressed the opinion that much of the discomfort experienced in northern latitudes was due to the steady heat indoors which dried the air, making the difference in the humidity between the inside and outside atmosphere very great.

In the *Journal of the American Medical Association* of June 30, 1906, is an editorial on a "Variable Temperature Therapy of Fever." This deals with the problem of the variation of temperature and its effects, and is withal so suggestive that we reproduce the editorial:

"One of the interesting developments in modern therapeutics is the use of fresh air in the treatment of tuberculosis and of all the other diseases that are related to it in their effects on temperature and general health. As the result of the success of these newer methods there has come to be a very general impression that fresh air can also be of great service in the treatment of all febrile affections. It used to be considered necessary that patients suffering from tuberculosis, especially if the disease were running a febrile course, should be kept in an equable temperature without any danger of being affected by draughts or by air that came directly from outside the house. This has been recognized as one of the mistakes of the older method of treatment, and as a consequence there is coming to be a general impression that other fevers, no matter what their origin, may also be best treated so far as possible in the open air.

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Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

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"The ideal of house and hospital ventilation has come to be that an abundance of fresh air should be supplied, but that this air should always be of a definite temperature, not much below 70°, in order to avoid the supposed dangers of draughts and the exhaustion that might be due to radiation of heat. Is it not possible, however, that this ideal has been founded on a mistaken notion? Under ordinary circumstances, healthy individuals have been accustomed to live under conditions of temperature that represent a variation of from 20° to 40° or more Fahrenheit during the course of the day. This variation of temperature acts as a stimulant to various metabolic processes within the body. It now seems manifest that the reactions by which disease is overcome are to no small extent dependent on the stimulations of metabolism consequent on variations of temperature. Dr. Burney Yeo has called attention in his book on 'The Therapeutics of Mineral Springs and Climates' to the fact that, while a mild, equable climate without noteworthy variation between day and night temperature is good for patients suffering from catarrhal symptoms of various kinds, such a climate is only conservative, but never actively curative. It lacks the supreme quality of natural stimulation that is so effective for increasing resistive vitality. Tuberculous patients, Yeo says, do not improve unless there is a daily variation of at least 20 degrees of temperature; hence it is that while consumptive patients are often very comfortable along the northern shores of Africa, they do not improve to such a degree as to be able to live out of that climate. On the other hand, it is well known that at a considerable altitude, where the changes between night and day temperature are marked and always represent from 30 to 50 degrees of variation, consumptive patients, according to clinical experiences, are more likely to get well, and even to be able to resume their previous occupations, than anywhere else.

"Certain it is that the ordinary healthy individual would not find himself under favorable circumstances for continued good health in an absolutely changeless temperature. It is a little bit like an absolutely unirritating diet. A certain amount of irritation of the gastrointestinal tract is needed in order to maintain peristalsis. In the same way the irritation of the skin consequent on variation of temperature stimulates the vasomotor mechanism of the capillary system of the skin and so proves excitant to metabolic activity through the increased circulation. It is in the exhausting processes of continued fever that such stimulation is most needed. The suggestion made by Dr. Walter James at the recent meeting of the Association of American Physicians at Washington that all fever patients should be given the benefit of this important therapeutic factor calls attention to what has been a much neglected feature of physical therapy.

"There seems to be considerable clinical experience already at hand to justify the employment of this method of treatment quite apart from recent advances in phthisiotherapy. In New York at the Presbyterian Hospital and at the Fordham Hospital the treatment of pneumonia in the open air, the patient being protected only by a tent even in inclement weather, it is claimed has given better results than the most careful housing of patients. A distinguished English clinician declared that if he had pneumonia himself he would prefer to be treated under the trees of a park than in the best-appointed hospital of any large city in the world. Pneumonia is one of the diseases in which owing to the inflammation in the lungs it might be thought that warm air would be of more benefit than cold air, yet clinical experience is all against such an impression. In other

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fevers there is no doubt that patients are much less restless, sleep far better at night, and need fewer sedative drugs, and these are practically always depressant to some degree if they are kept directly in contact with the outer air than otherwise. In fact, it is this feature of the cases that is particularly noteworthy. Sleep depends, so far as we know anything of its physiology, on cerebral anemia, and this does not readily occur unless the blood-vessels of the skin have been stimulated by variations of temperature during the day. When cold-air baths can be given to typhoid fever patients there is very little need of cold-water baths, and even cold sponges need not be employed so frequently as is ordinarily the case. Cold air is much less depressing than cold water, and does not require for its application either the apparatus or the disturbance of the patient necessary for cold bathing.

"It would seem, then, that cold air should be admitted much more freely than has been the case, especially to fever patients. It is well known that children suffering from surgical tuberculosis improve rapidly and sleep much better in a room so cold that nurses and physicians need to wear gloves and special wraps in order to keep comfortable. There has been entirely too much dread of cold air and of the effect of draughts. Draughts can only cause congestions when patients' temperatures are already somewhat subnormal. With a temperature above normal there is apparently no danger of the taking of cold from the presence of cold air, while there are apparently very desirable therapeutic effects quite in line with our recent advances in natural and physical therapy that may thus be obtained. Much prejudice needs to be overcome before sufficient clinical experience to determine its value can be secured, but it seems well worth trying faithfully and diligently."

It is evident that the outdoor cult is securing many adherents. The question is pertinent, if the fresh-air treatment of disease is so useful why may it not be beneficial for those who are not ill? It also raises the further question as to whether practically all of our respiratory diseases, acute and chronic, are not house disorders. The discussion of these various topics would lead us too far, but they afford food for reflection.

MOTOR-DRIVER'S SPINE.

Among the latest additions to the occupation neuroses is the description of a case to which W. J. Burroughs (*Lancet,* July 7, 1906) gives the above term. The illness began April 3. On that day the patient was employed to drive a large motor car, and began work at 3 P.M. Ordinarily the machine took considerable power to start it, and the difficulties in its operation, and possibly its vibration, were increased on that day by some defect in the mechanism. He returned more than usually exhausted, was highly nervous, and complained of persistent acute pain which he referred to the right hip, and which soon became so intense that he was unable to lie on that side. There was a dull aching pain across the loins, more pronounced on the right side, and he was unable to move the right leg. There was acute pain in the right leg, and the pressure of the bedclothes was painful. During his illness the temperature was normal. The pupils were equal and reacted to light. There was tenderness on pressure to the right of the third and fourth lumbar spines, extending outward for about six inches over an area about three inches wide. There was marked spastic rigidity of the right leg. Both the hip and knee of the right side were slightly flexed, but any attempt at further flexion or extension caused considerable pain. There were no vesical or

rectal symptoms. The patellar reflex in both legs was exaggerated, but more so on the right side. The skin of the right leg was hypersensitive, more especially on its inner surface. Drawing the finger slowly up the sole of the right foot caused great pain, and was followed by a quick retraction of the foot, a movement that the patient could not accomplish voluntarily. Ankle clonus was not obtained. The condition of the left leg apart from the increased knee-jerks was practically normal.

On April 5 the symptoms improved, and on April 6 the knee-jerks on both sides were absent, the rigidity had disappeared, and there was complete anesthesia of the whole of the right leg, with a diminution of sensibility to heat and cold. Sensation in the left leg was unimpaired. The pain in the hip was better. On April 7 the knee-jerks were still absent. The sensibility of the right leg had returned in part; the patient with his eyes closed was unable to locate the precise spot where he was touched, even when a considerable interval existed between. The pain in the hip disappeared, and there was only a slight sensation of girdle pains at long intervals. On the 9th of April there was marked improvement, and by the 17th the patient had practically recovered, and a few days later left the hospital.

A diagnosis of localized myelitis was based on the slight alteration in temperature, the irregular symptom-grouping, and the spastic condition of the right leg, also the early alteration of sensation, which was first hyperesthetic, followed by a loss of sensation together with a subsequent recovery of sensation. The writer is unable to say whether the pathological state produced was the direct outcome of the constant jarring, or the excessive muscular effort required of the patient on the particular day on which the symptoms developed.

MORTALITY IN THE JAPANESE ARMY.

The official figures have recently been published by the Japanese Minister of War. There were killed 47,152, died of wounds 11,424, and of sickness 21,802. When one comes to consider the length of the campaign, the enormous number of combatants, and the length of communications, these results seem well-nigh marvelous. Compared with our recent fiasco in the Spanish-American war with its defective supplies, embalmed beef, and the wholesale sacrifice of American soldiers, a large number of which did not have to leave the country, these results leave nothing to be desired. Major Lynch concludes an article in the *Boston Medical and Surgical Journal* of August 2 on the medical department of the Japanese army, which he says was a good one, and particularly the method of utilization of the Red Cross. It supplied a large, trained personnel to reënforce the medical department. The various agencies employed succeeded in promptly succoring the wounded on the field of battle and in removing them to the rear, when they were put into hospitals with ample supplies.

In the early period of the war there was no confusion in the medical department. He points out that the success of the Japanese consisted in thorough preparation for war, and this was provided for in the medical department by a large personnel and a free expenditure of money, with easy methods of accounting for it. He refers to the fact that they did not stint the medical department, and every bit of red tape was eliminated so far as the war was concerned. He is not sure whether this resulted in a loss to the government, but is convinced that no great sum could have been misappropriated. Not alone to the medical department is the brilliant result to be attributed, as that was only part of an excellent organization. There was a good deal of sickness, but

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very little of it could have been prevented excepting beriberi. Good hygiene was promoted by the patriotism of the soldiers and by that of the people. The thorough discipline of the army was a great factor in preventing men from disregarding sanitary rules.

In summing up his estimate of the Japanese, Major Lynch says that "they have no godlike attributes, but are human and prone to err. They have, however, the practical, sane faculty of learning by experience; their sanitary work and their provisions for the care of the sick and wounded were much better in their recent contest than in their struggle with China. They have taken to heart the lessons of the Japanese-Russian war, and others will do very well if they profit by them to an equal extent."

A SMOKE-LADEN ATMOSPHERE.

The Philadelphia County Medical Society at the meeting of June 27, 1906, discussed the general aspect of the smoke problem, which is an ever-present evil in most American cities. J. Madison Taylor discussed the importance of pure air, particularly for the town dweller. He referred to the fact that there was no reason why the air should be polluted by large manufactories, railroads, and other corporations. Attention was called to the fact that laws are passed to regulate the emission of smoke, but they are practically dead letters, and physicians fail to discharge their duties unless they maintain a continuous propaganda to teach the people the importance of a pure atmosphere. W. M. L. Coplin discussed smoke as a nuisance, but he was not sure that it had a direct deleterious influence upon the pulmonary structures. As yet there was little evidence to show that smoke in the atmosphere had a direct influence on morbidity and mortality, but unquestionably a smoke-laden atmosphere does interfere with respiratory function. C. J. Grayson said that it was unquestioned that a smoke-laden atmosphere had a very deleterious influence on the nose and throat. In Pittsburg after the discovery of natural gas it was found that there was a very marked decrease in diseases of the upper respiratory tract. L. Webster Fox called attention to the increased number of patients with external eye diseases, which he attributes to a dust-laden and smoky atmosphere. That the disease and discomfort caused by smoke in the atmosphere can be readily overcome was the contention of Henry Leffmann, who says that there is no need of smoke from the burning of soft coal, particularly under stationary boilers. Mechanical appliances are efficient in preventing the emission of smoke. All that is necessary is slow firing, so that the coal has time to coke before it is subjected to the intense heat of the furnace. This entails an additional cost for firemen or mechanical stokers. For locomotives and boats the mechanical stoker is out of the question, but much can be done by careful firing.

CAPITAL CRIMES IN CHICAGO.

According to an editorial in the *Record-Herald* of August 1, 1906, there were 187 homicides in Chicago, 29 of which were pronounced by the coroner as justifiable. That left 158 murders with which the law dealt or was supposed to deal. There is no reason to think that Chicago has a special preëminence in homicides, and it is probable that the record for the whole country is not very far behind that of Chicago. It is certain that a number of the large cities quite equal this record. There is a very instructive comparison in respect to capital crimes in the United States and that of other countries. In all Germany with a population of upward of 50,000,000 there are only 60 per cent more murders. England and Wales with sixteen times the popu-

lation of Chicago have only double the number of murders. France with almost twenty times the population has only three and one-third times as many murders. Belgium with three times the population has less than two-thirds as many murders. Canada with two and one-half times the population has only one-tenth as many murders. Andrew D. White, who has made a special study of the subject, says that with the exception of lower Italy and Sicily the United States leads the world in murders, and especially in unpunished murders.

Comparisons are said to be odious, but sometimes they may prove instructive. Certainly the difference between Canada and the United States in the matter of homicides is appalling. The Canadian population is not so different from our own. In many regions they have a mixed foreign element, and like ourselves they have the English common law. It is a significant fact that the law against homicides is rigidly enforced in Canada. The deliberate murderer has little chance of escaping the extreme penalty. That this wholly accounts for the difference we are not prepared to say, but it certainly is time that something was tried to stay the rising tide of homicide. Three murders a week are too many for a supposedly law-abiding city of two million people.

ELECTRICAL ORIENTATION IN SPINAL ANESTHESIA.

It will be remembered that the first suggestion of the possibility of spinal anesthesia and its demonstration was made by J. Leonard Corning. It remained for foreign observers to take up this method and put it upon a sure basis, though its dangers have led to some neglect of its application in the last few years. Unquestionably there remains a field for this method of anesthesia in certain operations, though its exact limitations and indications must be left for further study. One difficulty in spinal anesthesia is to know when the needle has entered the subarachnoid space. A flow of spinal fluid may be taken as a sure indication that the needle has perforated this space, but if the spinal fluid does not flow it is no certain indication that the needle is not in the spinal canal. The method which Corning has recently devised is based on a somewhat different principle. The metal needle is insulated to within a thirty-second of an inch of its point and connected with a faradic battery. The insulation is accomplished by coating the needle with shellac of fine quality, which does not interfere with the introduction of the needle. When this needle is introduced it irritates the sensory nerves of the cauda equina, and is followed by a pain in the leg, thus showing that the needle is in the spinal canal. Whatever may be the result of this method of orientation, it is certainly an ingenious application of physiological principles.

INTERMITTENT LIMPING.

Charcot was the first to call attention to intermittent claudication, and he early ascertained the relation of this condition to sclerosis and thrombosis of arteries of the lower extremities. The majority of cases that are reported seem to show that gross arterial disease is the most important factor in the causation of this condition, though he does not deny that vasomotor irritability and spasm, such as are found in neurotic subjects, may not be a causative factor. I. H. Irish in a paper on intermittent claudication (*Albany Medical Annals,* July, 1906) calls attention to the importance of examining the pulsation in the arteries of the leg. Often by mere inspection after prolonged muscular effort the signs of circulatory disturbance are present. In most cases the pulsation in the posterior tibial and dorsalis pedis arteries is

absent or weaker than normal. He has determined that absence or deficient pulsation in these arteries is an important sign in general arterial sclerosis. Eighty cases were examined, in twenty of which there were evidences of arterial sclerosis. Those who had no symptoms of arterial disease presented no anomalies in the pulsations of these arteries. In the twenty cases of pronounced arterial sclerosis the pulsation was found to be absent in one or both of the arteries. He expresses the belief that in arterial sclerosis the pulse in the feet is far more often interfered with than is generally believed. Certainly the absence of pulsation, connected with pain, stiffness, weakness, and paresthesia of the legs after muscular exertion, is of diagnostic importance.

THE AFTER-CARE OF THE CONSUMPTIVE.

In the antituberculosis crusade attention has been devoted to the means of preventing infection, the discussion of laws relating to notification and also to treatment of the tuberculous, particularly the establishment of sanatoria both public and private. There can be no doubt of the value of this movement and of the amount of good which it has already accomplished. There is another feature which has been given comparatively little attention, and that is the after-care of the tuberculous. In those who are well-to-do this problem is not difficult, but for the working man, and particularly for the working woman, the problem of how to live after the disease has been arrested is one of paramount importance. Already the public is becoming fairly well educated on the main topics relating to tuberculosis, and the one that has sunk the deepest in the public mind is the feeling that tuberculosis is contagious; hence in the narrower field that is open to the employment of women, which is largely in a sedentary way and in comparatively close contact with others, the problem of occupation is all-important. For working men there is a much wider range of choice. The man who has been employed within doors can obtain work on the farm or in various out-of-door occupations, but the number of places open to women in out-of-door work is very limited To return to the same surroundings under which the disease was contracted is almost certain to mean a recurrence. Discussing this one feature of the antituberculosis crusade shows how the problem of tuberculosis is essentially a sociologic and economic one. With the disease arrested it is highly important to discuss the question of after-care.

A SERUM REACTION OCCURRING IN PERSONS SUFFERING FROM INFECTIVE CONDITIONS.

L. C. Bruce (*Journal of Mental Science,* July, 1906) has discovered what may prove to be a valuable clinical sign in certain mental disorders. He was experimenting upon opsonic indices in the insane, and noticed that in many cases there was an agglutinative reaction upon healthy red blood-corpuscles. The technique is very simple: .25 Cc. of blood is freshly drawn and mixed in a small test tube with 5 Cc. of a one-per-cent solution of sodium citrate in normal saline solution. The tube is then centrifuged, the supernatant fluid pipetted off, and the red blood-corpuscles washed twice in normal saline solution. A sufficient quantity of the last washing of normal saline solution is left to form an emulsion of red blood-corpuscles measuring about .5 Cc. The blood to be tested is drawn into a small glass pipette holding roughly .25 Cc., and allowed to stand until agglutination takes place, when the serum is separated from the clot by the centrifuge. One part of the serum to be tested is left with two parts of the red blood-corpuscles in the well of a hanging-drop slide. Within a few min-

utes, if the case is an infective one, the red blood-corpuscles run into clusters, which in many cases are visible to the naked eye, and in others must be examined by a low power of the microscope. Bruce has found that this agglutinative reaction was present in mania with and without confusion, katatonia, hebephrenia, the depression of circular insanity, and epilepsy with excitement. Cases of insanity due to other causes than bacterial infection, such as melancholia of metabolic origin, systematized delusional insanity, insanity the result of exhaustion, brain anemia, etc., do not give this reaction. The reaction is not diagnostic of insanity, as it can be obtained in chronic rheumatism, pernicious anemia, typhoid fever, etc. Bruce points out that this reaction can be made of practical value. By means of this simple test it is possible to differentiate melancholia of metabolic origin and the depression of manio-depressive insanity, which is an infective disorder, and it will be possible to divide cases of insanity into two great classes, infective and non-infective.

RECENT PROGRESS IN CANCER RESEARCH.

The work accomplished under the auspices of the British cancer research fund has been of such a thorough character that our knowledge of malignant disease has been greatly advanced, even though the much-sought-for cure of cancer is not found. In previous issues we have devoted considerable space to the review of the published reports of the work done. One of the most important of these was the identification of tumors having the histological structures of cancer in the lower animals, and the demonstration of its transmissibility from one individual to another. The importance of such a discovery can scarcely be overestimated, as it affords an opportunity of studying the biologic characters of malignant growths that has heretofore been impossible. A recent cable report to the Associated Press hints that a cure for cancer has been found, but it is probable that this claim has been much exaggerated. Upon reading the text of the report it shows that a method of immunization against these experimental tumors has been found. Of course it is a long step from such an observation to the application of a method which will be successful in treating cancer in the human being. Fuller reports from the laboratory will be awaited with great interest.

A PROPOSED INTERNATIONAL MEDICAL REVIEW.

A prospectus has recently reached us of a new journal which is to be edited by Hugo Neumann, and published by L. Simion, of Berlin. Attention is called to the fact that medicine does not belong to one country or one nation, but so far little has been done to promote an international exchange of medical knowledge. To overcome the difficulty of numerous languages it is proposed to publish the new *International Medical Review* simultaneously in six languages, English, German, French, Italian, Spanish, and Portuguese. A Russian edition has been projected. The *Review* is to be a quarterly at first, and it is hoped that the edition may reach 100,000 copies.

ORIGINAL ARTICLES.

THE TREATMENT OF NON-MALIGNANT AND NON-TUBERCULAR SKIN LESIONS.

BY W. S. NEWCOMET, M.D., PHILADELPHIA.

In undertaking to review this subject it would be presumptuous to give a detailed description of any series of cases, as it would simply occupy valuable space and little would be gained; therefore only a short résumé of each disease will be given, with attention to the more unusual aspects that have come to notice.

As year after year passes the conservative element in medicine acknowledges more and more the value of the Roentgen ray, and this has been brought about by two great factors: our results are better, while our failures and accidents are fewer. This is chiefly due to a more careful selection of proper cases for treatment. While in many instances an exact prognosis is often given, at the same time the Roentgen ray has been recognized to be a dangerous as well as useful agent, and very few institutions at this date relegate this department to some unskilled operator, as was done in the early years. We must acknowledge that this line of work is decidedly more tedious than writing a prescription, but will any other form of treatment in medicine accomplish the same result?

Alopecia Areata.—Our experience has been decidedly favorable in cases in which this mode of treatment has been adopted, and the journals contain many reports that will substantiate it. However, many authorities in dermatology still object to this method, claiming that most cases of this disease usually regain the normal growth of hair in due time; but the argument of a French physician is somewhat to the point in this instance when he asks, "Why should we wait for three years, as is usual under the older methods, while the same result is brought forth in three months?" We need fear no accidents in these cases, as treatment should be of the mildest character, and so far none have been reported.

Hypertrichosis.—While considering alopecia areata we might refer to what would seem to be apparently the opposite condition, where the human economy has been overindulgent. In this unfortunate condition our results were not always what might have been expected, and usually relief in these cases was only temporary. In several instances severe burns were produced, followed by considerable ulceration; in one instance where it lasted for three months, while there was distinct evidence of an *x*-ray scar after healing, yet the hair came back. The idea of producing a deep burn in these cases was due to the fact that on several occasions after nevi were treated the downy hair covering the face did not recur, leaving the area quite conspicuous. Lately very few cases of hypertrichosis have accepted treatment when the ultimate result was explained.

Acne.—Favorable results may be expected from the cautious use of this agent in all forms of this disease, and no objection can be offered to its use, as only very mild *x*-rays from a moderately soft tube should be used; the time varies according to the judgment of the operator. As this disease is usually on the face—at least it is where the patient desires the more immediate relief—the hair, eyebrows, etc., should be protected, and if sufficient care is used there is very little likelihood of any accident happening.

Pusey states: "The results in this disease have been a little short of marvelous."

Psoriasis.—In cases of this disease in which the Roentgen ray has been employed favorable results have been reported, and here as in acne only the mildest form of treatment is usually required. In this affection our judgment is frequently taxed to know just where to begin, as the eruption is often so general or so scattered. Several instances have been observed in which decided improvement followed by simply allowing the patient to stand in front of an active *x*-ray tube with no protection except for the face, and although this procedure seems to be rather hazardous, if sufficient care is used accidents are not likely to happen.

Eczema.—Most cases of eczema that come under treatment will be found to heal easily, although now and then one presents itself that proves quite refractory. In such instances if a moderately severe burn is produced, and then the treatment stopped, improvement usually follows. It must be remembered that the *x*-ray is not a general panacea, to cure all impossible conditions, and in eczema, above all other ailments, this fact must be fully considered: for instance, when the disease is due to some direct cause or mechanical irritation, or when it is dependent upon some systemic derangement, of course that must be our first consideration, otherwise the *x*-ray is likely to prove harmful rather than beneficial. The evidence of this is plainly seen in leg ulcers; as is well known, if the source of irritation is relieved, healing usually follows. Personally, I believe *x*-ray treatment of these cases does not seem justifiable.

The varieties of eczema in which this form of treatment stands alone are the scaling usually seen in persons past sixty, the preëpitheliomatous or senile eczema, and one that is closely allied to it, Paget's disease of the nipple. In these senile cases it is wonderful to see the improvement that follows a few light applications. But as a class eczemas will tax our judgment more than all the other conditions that present themselves for treatment.

Fordyce's Disease.—About a year ago a young man presented himself with this rather unusual condition of the buccal mucous membrane, and as all other forms of treatment had proved ineffective the *x*-ray was tried; although it was pushed until considerable dermatitis was produced, no result followed that could be ascribed to this method.

Keloids.—This disease has for a long time baffled medical science; treatment in all its varied forms has utterly failed. As to a surgical procedure there is little to be gained thereby, for if these scars are totally removed, in the immense majority of instances a prompt recurrence is to be expected, and while the results from *x*-ray treatment of this condition cannot be regarded as ideal, in most cases in which it has been properly employed decided improvement if not entire absorption has followed.

Some failures have been due to the fact that the treatment was too vigorous in the beginning and not carried over a long enough period. It will often take a year or eighteen months to get a fair result, and as the disease is very common in the colored race, this more vigorous form of treatment will destroy the pigment cell of the skin and a more unsightly scar will follow. It will be found on the other hand that if these cases are treated with a very weak tube the skin will in time become darker while the excess of tissue is slowly absorbed.

Nevi.—There has been a diversity of opinion expressed upon this subject, and in cases that have come under observation, although in all instances the patients seemed to be pleased with the results, my personal opinion is that there still appears to be room for considerable improvement. The scar that results after the

nevi have been removed lacks the pigment cells, and consequently is usually whiter and at the same time somewhat softer than the surrounding skin; this leaves the area more or less conspicuous, but not to such an extent as the pigmentation was before treatment. At the same time we must consider the variety of nevi to be treated, whether it is the simple pigmented form or one that is more vascular. Unfortunately, in most of these cases it is necessary to produce a severe reaction, and as these nevi are better supplied with blood-vessels than the surrounding tissue, they are proportionately hard to burn. Here again is illustrated the resistance of the vascular system. Where the vessels are large with the formation of a tumor, several successive burns may be required, but great care must be used not to devitalize the tissues or deep sloughs may follow, with more or less deformity of the part.

An accident that came to notice in one instance under observation was what may be termed a late burn. It appeared about thirteen months after the primary burns had healed. The original nevus occupied the whole right cheek. This ulceration was about the size of one's finger-nail, just above the corner of the mouth; it lasted about two months, was very painful, and had all the appearances of a primary burn.

In another case, after the ulceration caused by the *x*-ray had healed the scar was the site of an unpleasant itching that continued for months. Treatment in this case did not give any relief to this disagreeable symptom. Yet with all the trials that annoyed these patients they were well pleased. While the results were far from perfect, no doubt as we become more experienced we will learn to produce a scar that will resemble the surrounding skin, or at least blend with it more perfectly.

These instances just mentioned in this article illustrate the fallacy that was current until a year or so ago, when the use of the *x*-ray was regarded as an agent of *dernier ressort;* and why should it be? Why should a case of alopecia areata or acne go through the long line of innumerable, invariably useless remedies? Why should not the *x*-ray be employed in the beginning, in suitable cases, and save the patient that useless waste of time and expense? Unfortunately the few accidents that have occurred, usually in the cases presented for diagnosis, seem to have attracted greater attention than the good results. Let it be emphasized furthermore that these accidents did not occur in cases under treatment. As we are just about to gain the confidence of the general profession another adverse point has been raised, just why is hard to tell. For the simple reason that experiments upon lower animals show that the *x*-ray has caused degeneration of the testicle and ovary, notice has been published warning all operators to be careful not to produce sterility in their patients. Would any physician be apt to prescribe an overdose of strychnine? Yet this accident has occurred, and is more likely to occur than the one to which reference has just been made. Ample proof with argument has been published in other articles.

It seems peculiar that a number of people in our community always stand in the way of progress, not alone in medicine but in all lines of useful arts. The sewing machine and the locomotive are typical illustrations, and just so in this instance there is not the least reason why this point should be raised, as evidence so far is only of experimental value.

While in most instances of local skin lesions the *x*-ray has proved beneficial, it would be well to call attention to one case in which it acted quite to the contrary. A case of syphilis was mistaken for a surface epithelioma, and com-

plete destruction of the eye followed. No doubt this is an example of many other instances in which the *x*-ray has been employed and failure resulted. It was not the improper use of the agent that caused harm, but a mistake in diagnosis. Unfortunately the great number of practicing physicians possess very little knowledge of dermatology, and where this method of treatment is to be employed it will be more satisfactory to all concerned to have this point of diagnosis settled before beginning.

A STUDY OF THE CAUSE OF SUDDEN DEATH FOLLOWING THE INJECTION OF HORSE SERUM.

BY M. J. ROSENAU AND JOHN F. ANDERSON.

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SUMMARY AND CONCLUSIONS.

Normal horse serum, when injected into the peritoneal cavity of a normal guinea-pig, produces no symptoms. When injected subcutaneously there may result at most a slight local reaction consisting of swelling and edema, which gradually disappears.

Antitoxic horse serum is equally harmless for normal guinea-pigs.

Horse serum is, however, poisonous to a guinea-pig which has previously been injected with horse serum. The "period of incubation," or time necessary to elapse between the first and second injection, is about ten days. Under these circumstances horse serum is poisonous whether injected subcutaneously or into the peritoneal cavity.

The first injection of horse serum renders the guinea-pig susceptible.

The symptoms caused by the injection of horse serum into a susceptible guinea-pig are respiratory embarrassment, paralysis, and convulsions, followed by death. The symptoms come on usually within ten minutes after the injection, and when death results it usually occurs within one hour, frequently in less than thirty minutes, and sometimes within a few minutes.

The poisonous principle in horse serum appears to act upon the respiratory centers. The heart continues to beat long after respiration ceases.

The toxic action of horse serum bears no relation to diphtheria. The poison is not *toxone*. Guinea-pigs cannot be rendered susceptible by previous infections with the *B. diphtheriæ* or by previous injections with diphtheria toxin.

It seems from our work, however, that guinea-pigs first injected with a mixture of diphtheria toxin plus horse serum are more sensitive to subsequent injections of horse serum than are guinea-pigs sensitized with a first injection of horse serum alone.

Diphtheria antitoxin plays no part in this poisonous action, and in itself is harmless.

As soon as we realized that the toxic principle in horse serum exerts its action in quantities so minute as to place it almost in the category of the ferments, and further, when we concluded from our work that this toxic principle is doubtless one of those highly organized and complex proteid substances belonging to the "haptin group" in the sense used by Ehrlich, we recognized how futile it would be with present methods to attempt to isolate this substance. Nevertheless we devoted much time and study to the relation of this toxic principle

to various chemical, physical, and electrical influences. The practical importance of eliminating or neutralizing this toxic principle in horse serum is at once evident.

It is probable that when the strange proteid is introduced into the guinea-pig it causes a reaction resulting in a production of "antibodies," so that when a second injection of horse serum is given there is probably either a union or a reaction between the antibodies and a substance in the horse serum which produces the poisonous effect.

This poisonous principle is quantitatively specific—that is, guinea-pigs treated with horse serum are rendered somewhat susceptible to the subsequent injection of the serum of another animal. Guinea-pigs treated with the serum of another animal are slightly sensitive to the toxic action of horse serum.

Guinea-pigs treated with the serums of various animals and subsequently injected are much more susceptible to homologous serums than to heterologous serums.

This poisonous action has no relation to hemolysis. Our work proves that blood serum may contain an acute poison entirely independent of any hemolytic action. Normal horse serum has no lytic power upon the red corpuscles of the normal guinea-pig.

This poisonous action has no relation to the specific albuminous precipitins.

The poisonous principle in horse serum is not affected by a temperature of 60° C. for six hours, but it is destroyed at 100° C. for fifteen minutes.

The poisonous principle is filterable through porcelain, is not injured by drying, and cannot be separated by precipitation with ammonium sulphate and subsequent dialysis.

The following chemical substances do not oxidize, neutralize, or precipitate the poisonous principle in horse serum: Butyric acid, permanganate of potash, citrate of soda, alcohol, succinic peroxide acid (alphozone), hydrogen dioxide, and ammonium sulphate. The presence of chloroform or trikresol (0.4 per cent) does not interfere with this poisonous action.

Serums eight years old are as toxic as those freshly separated.

Exposure to *x*-rays does not affect the poisonous action of horse serum.

It requires about ten days after the first injection of horse serum for a guinea-pig to show susceptibility to a second injection. A guinea-pig remains susceptible a very long time, at least 160 days.

As small a quantity as 1-1,000,000 Cc. of horse serum was sufficient in one instance to render a guinea-pig susceptible. Quantities varying from 1-250 to 1-1000 Cc. almost invariably render guinea-pigs highly susceptible when given in the toxin-antitoxin mixture.

One-tenth cubic centimeter of horse serum injected into the peritoneal cavity of a susceptible guinea-pig is sufficient to cause death. The same quantity inoculated subcutaneously may cause serious symptoms.

There is some evidence to show that the sensitizing substance in horse serum is the same as the poisonous substance. The sensitizing substance is not affected by precipitation with ammonium sulphate and dialysis.

Guinea-pigs may be sensitized with horse serum that has been dried and redissolved.

The sensitizing substance is not affected by a temperature of 60° C. for six hours.

It is probable that small quantities of horse serum render a guinea-pig more susceptible than do large quantities. If this be true, it is due, perhaps, to the fact that large quantities, owing to slow absorption or prolonged reaction, partly immunize the guinea-pig at the same time that it is being sensitized.

The sensitizing substance apparently is not free in the blood serum of guinea-pigs.

An active immunity against this toxic prin-

ciple may readily be established by repeated injections of horse serum, at short intervals, into a guinea-pig. Although guinea-pigs may be immunized actively in this manner we have not yet succeeded in transferring this immunity in the blood serum or body juices to another guinea-pig. It therefore appears that the immune bodies, if such exist against the toxic action of horse serum, are not free in the blood and body juices, contrary to the case in diphtheria.

Guinea-pigs may be sensitized to the toxic action of horse serum by feeding them with horse serum or horse meat.

The fact that guinea-pigs may be rendered susceptible by the feeding of strange proteid matter opens an interesting question as to whether sensitive guinea-pigs may also be poisoned by feeding with the same serum given after a proper interval of time. If man can be sensitized in a similar way by the eating of certain proteid substances, may not this throw light upon those interesting and obscure cases in which the eating of fish, sea foods, and other articles of diet habitually causes sudden and sometimes serious symptoms?

The susceptibility to the toxic action of horse serum is transmitted hereditarily from the mother guinea-pig to her young.

These results upon the hereditary transmission of the susceptibility to the poisonous action of horse serum in guinea-pigs may throw light upon the well-known hereditary tendency to tuberculosis in children born of a tuberculous parent. There are certain analogies between the action of tuberculosis and horse serum. Both may produce a hypersusceptibility and also a certain degree of immunity. Now that we have proved that this hypersusceptibility or anaphylactic action in the case of horse serum may be transmitted hereditarily in guinea-pigs, may it not throw light upon the fact that tuberculosis "runs in families?"

Demonstrations of the hereditary transmission of acquired characters are comparatively rare in biology. While there are several recorded instances demonstrating that immunity to certain infectious diseases may be transmitted from a mother to her young, yet, as far as we know, this is the first recorded instance in which hypersensitiveness, or anaphylaxis, has been experimentally shown to be transmitted from a mother to her young.

Other albuminous substances, such as skimmed milk, peptone, hemoglobin, egg-albumin, and vegetable proteids possess no poisonous action upon guinea-pigs sensitized with horse serum. Whether guinea-pigs are rendered susceptible to a subsequent injection with the same albuminous matter with which they have been sensitized will be reported in a later paper.

We believe that the substance which sensitizes the animal is identical with that which later poisons it. However, the substance must first cause a reaction in the organism resulting in a production of antibodies. We have found that small quantities of horse serum produce, after a definite period of incubation, a condition of anaphylaxis; multiple or repeated injections produce immunity. We therefore possess in horse serum a substance capable of causing both anaphylaxis and prophylaxis.

It may be that man cannot be sensitized in the same way that we have shown to be the case with guinea-pigs. Children have, in a number of instances, been injected with antidiphtheric horse serum at short and long intervals without, so far as we are aware, causing death. Certain serums—for example, the antitubercle serum of Maragliano and the antirheumatic serum of Menzer—are habitually used by giving injections at intervals of days or weeks. In all such cases of frequent and repeated injections the amount which has been injected and the interval between the injections must be

taken into account in relation to our work. Von Pirquet and Schick have shown that a second injection of horse serum into children causes an "immediate" or an "accelerated" reaction. Both the immediate and the accelerated reaction in children are characterized by symptoms of "the serum disease."

We might conclude that children may not be sensitized to the toxic action of horse serum by eating horse meat, for horse meat is a favorite article of diet in certain European countries, and there is nothing upon record to show that the injection of horse serum in those countries is fraught with more danger than where this diet is not used. It should, however, be borne in mind that our work has shown that guinea-pigs may be sensitized with exceedingly minute quantities of a strange proteid, and that repeated injections cause an immunity, and it does not seem impossible that the same action may be true of food.

Man reacts to the first injection of horse serum after a period of eight to thirteen days; guinea-pigs show no reaction as a result of the first injection; both man and guinea-pigs react to a second injection. The reactions in man and the guinea-pig differ, however, both in severity and in kind. The relation, therefore, that our observations upon the guinea-pig may have in their application to man must await further study.

The fact that other animals besides man and the guinea-pig react to a second injection of horse serum would seem to indicate that we are dealing with one and the same action.

We believe that our results make it probable that man may be rendered sensitive to the injection of a strange proteid, as is the case with the guinea-pig and other animals, and that this explanation must be considered as well as the status lymphaticus, which has heretofore been assigned as the cause of sudden death following the injection of horse serum.

[POSTSCRIPTUM.—After the galley proof of this article had left our hands an article by R. Otto, entitled "Das Theobald Smithsche Phänomen der Serum-Ueberempfindlichkeit," reprinted from Leuthold-Gedenkschrift, Band 1, first came to our notice. His paper deals with some of the problems we have studied, and his results are in harmony with many of our conclusions.]

SAL-ETHYL IN THE TREATMENT OF RHEUMATIC AFFECTIONS.

BY L. W. BREMERMAN, M.D., A.B.,

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Hardly a day passes that we do not hear of some *new* remedy for the treatment of rheumatism. As we travel our different walks in life we see, broadcast on every hand, advertisements setting forth the efficiency of some particular form of medicine for the cure of rheumatism. When questioned as to his reason for putting a specific for rheumatism on the market a well-known patent-medicine man remarked, "Why, every one has rheumatism." Facts seem to bear out his assertion—he accumulated a fortune. That this disease is recognized, both by the physician and the layman, as being a wide-spread affection, striking the wealthy as well as the humble, goes without saying. The layman, in his ignorance, seeking relief, grasps any nostrum to which his attention is directed by alluring advertisements, in which "cure-all" claims are made, backed by seemingly genuine testimonials as to its efficiency. It is not to be wondered at, then, that the enlightened and educated physician will use

a new drug which is a little better in its action than any of the old.

It does not seem necessary here to go into the theories of the etiology and pathology of rheumatic conditions. I do wish, however, to speak at some length of the efficiency and usefulness of a new preparation, for use in rheumatic cases, which has been of great service to me and has shown most excellent results in my patients, viz., sal-ethyl.

Ethyl salicylate is a transparent, colorless, volatile, slightly soluble, oily fluid. Tests made for its antiseptic action have proven conclusively that the fluid is not an antiseptic, but that it does slightly retard growth upon culture media. It has a pleasant, characteristic odor and taste, somewhat similar to but less pronounced than the methyl compound. Upon the mucous membranes of the tongue and fauces it produces a slight burning sensation, but upon the lips no irritation is caused. Upon the skin it gives no evidence of irritation. In guinea-pigs no irritation is produced by subcutaneous injections. Sal-ethyl is not absorbed from the respiratory tract or from the skin, but is quickly absorbed from the stomach or when given subcutaneously, and is very rapidly secreted through the kidneys. There is a gradual rise in temperature (afterward falling to normal) the first hour or so after the administration of a single dose. The pulse-rate is slowed at first, probably from vagus stimulation.

This drug has been used by me in a large number of cases during a period of two years, of which I will report a few.

A colored woman 29 years of age had all the diseases of childhood, from which she made a good recovery. Had typhoid fever at 20. Married; no children; no miscarriages. At eight had an attack of acute rheumatism, from which she made an uneventful recovery. When first seen by me the patient was suffering with severe pain, involving several of the larger joints—the knees, the ankles, and the shoulder-joints, all of which were swollen and red. She was running a temperature of 103°. I put her upon large doses of the sodium salicylate, together with an accompanying treatment of the alkalies. Milk diet. Used locally the ung. plumbi iodidi. Stomach rebelled, and she vomited after taking the sodium salicylate. I immediately put her on sal-ethyl, which had just been brought to my attention, giving her five-minim doses every hour during the first day. Her temperature rapidly dropped and the pain and swelling in the joints disappeared. The second day I gave her five-minim doses every two hours, and the third day the same every three hours. She was instructed to continue this for one week, at the end of which time she was able to be about and was feeling very comfortable. After the first dose of sal-ethyl her vomiting discontinued.

A man 30 years of age, whom I saw in consultation three weeks after the beginning of an acute attack of rheumatism. When I saw him every joint in the body was affected and the slightest movement caused pain. He had been given all forms of the salicylates without avail, but with the result that nothing could be retained on the stomach, patient even vomiting water. Suggested the use of sal-ethyl, followed immediately by improvement; pain, stiffness, and swelling in the joints rapidly became better, and in about two weeks patient was able to go to Cambridge Springs, where he was treated with massage, baths, etc., during which time he was taking sal-ethyl as well. He made a perfect recovery, without any permanent stiffening of the joints.

A member of my own family contracted a marked tonsillitis of rheumatic origin. Temperature was very high. Tonsils large and painful. Placed on liquid diet and the internal administration of five-minim globules of sal-ethyl every hour for twelve hours, and then

every two hours, together with ordinary local applications. Patient was up and about the house in three days. The peculiar feature of this case was that she had been a frequent sufferer from this condition, which had previously lasted from two to three weeks.

A man 33 years of age was suffering with a very painful, swollen ankle-joint, which came on rather suddenly after an alcoholic outbreak which lasted several days. Administered sal-ethyl, ten minims every hour for four hours, then five minims every hour. Patient running a high temperature. Applied locally ung. plumbi iodidi. The next day, owing to a very important business engagement, patient had to go out. He was in a very comfortable condition, and in several days was entirely recovered. Patient has had a number of similar attacks, due to the same cause, all of which have been treated in a like manner.

A patient seen in consultation had a swollen wrist-joint, which was very painful, so much so that he was given hypodermics of morphine. He had been given, internally, the pure oil of wintergreen and salol. Antiphlogistine had been applied locally. Patient was vomiting frequently and was very uncomfortable. When I questioned him he admitted that he had a slight discharge from the urethra. Examination showed this to be true. Prostate was enlarged and tender, showing an old abscess which had ruptured into the urethra. Recommended that the urethra and bladder be washed by the Janet method daily, with prostatic massage every other day. Internally sal-ethyl was administered, five minims every hour the first day, every two hours the second day. His physician had made several incisions into the tissue around the joint, which had nearly healed, so I applied locally ung. plumbi iodidi. Recovery was rapid, with the exception of a partially stiff joint, which I believe resulted entirely from the opening of the joint. Has made a recovery from this local condition. Am at present treating his prostatitis. Patient suffers an occasional slight attack of pain in this joint as well as some of the others, due, I believe, to his worshiping at the shrines of Bacchus and Venus, which is very naturally against my orders. In this particular case I think sal-ethyl is of little service, because the patient has remarked to me that he would not be without the globules, for his pain disappears almost from the first dose. He recognizes its benefit, and is more careless than he otherwise would be about following the directions regarding hygiene and diet.

A man 28 years old had had no sickness since childhood. During the night, without apparent cause, he had a sudden attack of terrific pain along the course of the sciatic nerve. I administered sal-ethyl ten minims every hour for six hours, then five minims every hour for six hours, and then every two hours. In three days the patient was entirely well, having improved rapidly almost from the first dose.

A man 28 years old had an acute gonorrhea, which soon became complicated, the posterior urethra, prostate, and seminal vesicles being involved. This was caused by carelessness of the patient in not following directions. He admitted sexual excitation, which no doubt was the cause of an epididymitis of the right side. Patient was placed in bed and ordinary treatment administered. Two days later he complained of pain in the left ankle-joint. Examination showed the part red and swollen. Applied ung. plumbi iodidi locally, and gave ten-minim doses of sal-ethyl every hour for three hours, five-minim doses every hour for three hours, and then five-minim doses every two hours. In addition I followed the ordinary methods of treatment for gonorrhea. In three or four days the patient was abso-

lutely free from pain. There was some slight swelling and stiffness of the ankle-joint. In about three weeks the patient was practically well. I am, however, still massaging the prostate and treating the urethra.

Case after case which I have treated might be recorded here, but the foregoing will serve to prove amply the efficiency of sal-ethyl. This preparation may be given almost fearlessly, in large doses, frequently repeated, without danger of heart complications or causing untoward gastric conditions. With the use of this drug I carry out, as far as possible, the ordinary dietary for this class of cases, combined with an increased water-drinking of about ten glasses during the day.

I look upon sal-ethyl almost as a specific, and use it in all cases. Have given up the use of coal-tar products entirely, due to their bad effect upon the heart, as well as the other forms of salicylates because of their peculiar action on the stomach.

In sal-ethyl we have a preparation which rapidly relieves the pain, shortens the duration of the attack, and in my opinion diminishes the sequelæ and complications, such as endocarditis and other bacterial complications.

No. 112 East 17th Street, New York City.

FIFTY BACTERIOLOGIC TESTS OF HANDS, BRUSHES, GLOVES, PASTEUR-FILTERED WATER, STEAM AND FORMALDEHYDE STERILIZERS, AND FORMALDEHYDE DISINFECTION OF ROOMS.[1]

BY A. GOLDSPOHN, M.S., M.D., CHICAGO,

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Aside from the periodical testing of sterilizers and of his own hands and those of his assistants when it was least expected—to which the writer has been accustomed for years—the occasion for the present experiments is the testing of the efficiency of the apparatus of a new hospital, which embraces some new features, and to bring to a discussion, incidentally, the formaldehyde disinfection of rooms. According to the most authoritative investigations and conclusions on the subject that have been a matter of record for years, and likewise according to the very creditable and recent experiments of the Illinois State Board of Health, some rather serious errors in formaldehyde disinfection have obtained in our city (Jacques, *Jour. Amer. Med. Assoc.*, Jan. 13, 1900; Owens, *Jour. Amer. Med. Assoc.*, March 3, 1900). This was occasioned by faulty experiments, in which the microörganisms were exposed to the antiseptic gas while in their culture medium. In doing this the medium absorbs the antiseptic gas so rapidly that it is no longer a food for the germs and they do not multiply. But it is a serious error to think because no colonies develop that therefore the germs which were purposely introduced are dead, because collateral experiments, correctly conducted, show that they are probably alive. All bacteriologists, in making such tests, expose the germs to the gas in a dry state on pieces of thread or paper as carriers that are too small to absorb and hold enough of the gas, and to carry it into the culture medium, where it might inhibit the growth, if they are not dead. The threads were used here, and in order to carry them safely from place to place and to expose them safely and without danger to the other con-

[1] Read before the Chicago Medical Society, May 23, 1906.

tents of the sterilizers little stubby bundles of "floss" (mercerized cotton thread used in embroidery) held together in a knot were placed in small test-tube-like homeopathic vials, made to order, quite strong, and with no neck, with a lumen of nearly half an inch, and about two inches deep. Into the bottom of these the threads could readily be placed by sterile forceps, and they were retained by a loose gauze diaphragm, placed half-way to the bottom, and a tighter cotton cork at the mouth of the tube. The latter were generally removed in the room experiments to admit the gas more readily, but not in the others. For the selection of the bacilli to use in the various tests and for advice about the general plan of this work, I am indebted to Prof. R. Zeit, from whose laboratory the germs were obtained and replenished as often as needed to assure sufficient virulence. The germs experimented with were the spore-bearing anthrax bacillus, *Bacillus coli communis, Bacillus pyocyaneus,* and the *Staphylococcus aureus.* All the experiments, except the hand and water tests, were made with pure cultures, and every single experiment or group of experiments with the identical batch of germs was offset by a "control" test.

Hands.—In the hand experiments, the hands are first scrubbed for eight or ten minutes in hot water, changed several times, with soft soap and rather stiff sterile brushes, that are kept so by sterilization in formaldehyde gas and storage in 8 per cent formalin, in solution. Next, the spaces under the finger-nails (properly trimmed) are very carefully scraped with the ends of good nail files, at first with the bare steel, and then with the same covered with gauze soaked in soft soap. The roots of the nails are likewise attended to. The hands and arms are then scrubbed in the same manner as before, in hot water, with a good wad of gauze full of soft soap, instead of a brush, for five to eight minutes more, and are then rinsed off in a current of water. They are then immersed to the elbows for three to five minutes in a deep tubular glass vessel, filled with bichloride of mercury, 1 in 3000, solution. Then they are treated with alcohol, two to four minutes, and are finally soaked in quite hot sterile water for fully ten minutes, to remove all disengaged remnants of antiseptics. A small bit of sterile cotton is now twisted on one end of a thick and stiff platinum wire, mounted by the other end in a glass rod. The covered end is then seized additionally in a pair of slender forceps and is rubbed under the ten finger-nails and across the roots of the nails of one person. The cotton is then deposited aseptically in a bouillon tube. Another similar wad of cotton is rubbed firmly along the grooves of the palms of both hands and the folds of skin between all the fingers and is deposited in another tube. In this manner eight pairs of cultures were prepared on two occasions from seven persons' hands and observed in an incubator at about 100° F. for ten days, without the slightest sign of growth in any of them. These tests would have been still more severe if the hands had been soaked in a boiled solution of sulphide of ammonia, instead of merely sterile water, previous to the grafting; but the water only was chosen, because it more nearly corresponds to the practical conditions in operating.

Filtered Water.—In this hospital, unlike most others, all the water that is intended for drinking and for surgical purposes is passed through a large Pasteur, so-called germ-proof, filter, of the most approved type, before it is sterilized. It is, therefore, a matter of much interest to know whether the water is germ-proof after it has passed through the filter. On each of two days, therefore, four gallons of water were allowed to percolate through a cork of absorbent cotton, in the bottom of a funnel, under strictly aseptic provisions and conditions. Nothing was visible, macroscopi-

cally, on these cotton plugs when they were transferred with greatest aseptic care into bouillon. Both of these cultures developed a film on the surface in five days, which did not increase much during ten days' further observation, and left the bouillon clear beneath it. Microscopically, this film consisted mostly of large rhomboid crystals with transparent agglutinating material, and, after the addition of acetic acid, the crystals disappeared with liberation of a gas and only dots of coagulated gelatinous substance remained. No signs of microörganisms.

Brushes and Gloves.—The results in experiments with infected brushes and rubber gloves will appear incidentally in the tests of the sterilizers, in which they constitute a part of the test objects.

Steam Sterilization.—Underlying this are several fundamental principles that are not sufficiently known or appreciated, viz.: (1) The air must first be removed from every sterilizer, because a mixture of air and steam does not kill. (2) Dry heat or dry air is worth almost nothing in surgery, because it does not penetrate and requires too high a temperature to kill. It is of value only for laboratory dishes and for things that are to be destroyed. It is only in combination with sufficient water moisture that heat penetrates and kills, and that steam is most germicidal, other things being equal, which contains a maximum amount of this moisture. (3) Steam under pressure tends to become drier. It may become too dry or "superheated," when its germicidal property diminishes, approaching that of hot air. The best review on this subject is by Bruno Heymann,[1] of the Fluegge Laboratory at Breslau, from whence many of the best researches on disinfection during recent years emanate. He describes seven different mechanical and chemical devices, aside from the anthrax spore test, by means of which the moment of penetration of a sufficiency of heat and moisture in the contents of a steam sterilizer is noted, and by some of them the duration of their action can also be determined.

Two types of steam sterilizers are in efficient use: one that works on the principle of Robert Koch's "Dampftopf," in which a current of the wettest kind of steam passes through the disinfecting chamber unconfined, preferably from above downward, and displaces the heavier air by gathering above it and crowding it out at the bottom. The penetration of a sufficient degree of moisture in this type of apparatus attends or produces the required temperature of 100° C., and the latter can readily be ascertained experimentally by placing a self-registering thermometer in the lower strata of the disinfecting chamber. This type of apparatus is more certain in its effect, if properly constructed, in unskilled hands, and is by far the most simple and inexpensive, but it requires about double the time that pressure machines require for disinfecting a charge. According to von Esmarck,[2] the firing surface of this type of sterilizer should not be less than ¼ square meter in area for a cubic meter of disinfecting chamber, while in the pressure steam apparatus it should be 3½ square meters for one meter of chamber space.

The other type of apparatus embodies steam under pressure in a closed chamber, from which the air is previously removed, partly at least, by being heated by means of a surrounding steam jacket, and then drawn off, in some of them at least, by the passage of a current of steam over a small aperture. The contents of the sterilizing chamber being previously heated to near the boiling point of water and being placed in a partial vacuum, they are prepared

[1] Heymann, Bruno: *Zeitsch. f. Hygienic u. Infectionskrankh.*, vol. l, p. 421, 1905.

[2] von Esmarck.

for very energetic action of the steam that is introduced under pressure, and does not require a long time to act. But the degree of absence of air and the degree of moisture of the steam under pressure are somewhat uncertain and yet most vital features in the process that only an expert operator would be able to determine. But this difficulty is overcome, according to Heymann, by employing both a stationary thermometer and a manometer to measure the pressure. Reynault has worked out a standard table of relations between these two, the temperature of saturated steam and its pressure. Thus, at 1/10 of an atmosphere it must be 102.7° C., and at 2/10 atmosphere it must be 105.2° C. This relation must be noted in each operation. But what to do when this required standard is not attained I would not know; and the much more complicated mechanism of the pressure apparatus makes it proportionately more liable to get out of order. An expert is needed to repair it, while any tinner can repair a non-pressure apparatus. But the only conclusive proof of the efficiency of any form of either type of such apparatus is afforded by testing it with spore-bearing germs of known virulence or resistance, as the writer has attempted to do in the following experiments. When not otherwise designated, two large Boeckmann sterilizers were employed, in which a current of quite wet steam (not confined) is active. They are provided with specially large gas fires and their outer cylinders are covered with asbestos to prevent the otherwise useless radiation.

Four of the experiments were made by putting one of the four different germ tubes above described into four fingers of an uninjured rubber glove and not removing the cotton stoppers. A strand of gauze of the size of a small finger was also introduced to extend from the base of the fingers out of the gauntlet to prevent collapse of the glove. It was then wrapped successively in two towels, fastened with safety-pins, and placed in the center of sheets, towels, gowns, etc., within the sterilizers. Counting from the time when steam began to appear at the top, the firing was continued two hours in the first, one and a half hours in the second and third experiments, and one hour in the fourth, with an additional half-hour in each test merely to dry out the things. None of these showed any growth, although spore-bearing anthrax was always present. In two other experiments a package containing the four different germ tubes was placed in the bottom of an open fruit jar crammed full of gauze. These were also fired two and one and one-half hours, respectively, with the half-hour for drying added. These eight tubes also gave no growth.

In three experiments a package containing the four germ tubes was wrapped in a particularly large and firm bundle of clothes and cotton, with a special effort to embarrass the penetration of the steam. These were also steamed two, one and one-half, and one hour, respectively, plus one-half hour for drying each. The anthrax in the one-hour experiment was suspicious of growth after ten days in the incubator. All the others remained clear. Two new finger brushes were sterilized in steam and soaked in a large bouillon culture of spore-bearing anthrax, wrapped in gauze and cotton, and dried at 60° to 70°. These brush packages were treated at different times for one and one-half hours in the current of steam, plus one-half hour for drying. The brushes were then placed in bouillon in large Petri dishes for ten days. No anthrax grew in either of them. In one a fungus grew as an accidental contamination.

Six other tests were made of a pressure steam sterilizer of the type of the Kny-Sprague apparatus. In the first four a package containing the four germ tubes was introduced in

each test, and in the last two the anthrax alone was introduced. These packages were placed as nearly as possible in the center of each charge to be sterilized. As usual forty-five minutes' firing was done each time, of which five minutes was to heat and exhaust the air, then twenty minutes to sterilize and twenty minutes to dry the contents. None of these eighteen tubes developed a growth, while the controls all grew.

Formaldehyde Sterilizer.—This consists of a galvanized iron box, 18 inches high, 18 inches deep, and 20 inches broad. It has a door on the front face, 17 by 19 inches, which is hung by hinges at the bottom so that it can be used as a shelf when open. It is constructed quite air-tight everywhere, except at the door fitting and a two-inch hole in the bottom through which a moderate flame from a Bunsen burner plays against a piece of sheet iron, which is laid over this hole on the inside. On this sheet iron a shallow graniteware dish is placed, containing usually one ounce of formalin in three ounces of normal salt solution, which is evaporated during one and one-half hours' firing. The apparatus is allowed to remain closed half an hour longer. This box is covered externally by asbestos and is coated with enamel paint inside. Its back and side walls project six inches beneath its bottom so as to secure a protected space for a small Bunsen burner to stand and to burn evenly beneath. This flame is so adjusted as to require about one and one-half hours to evaporate the four ounces of liquid in the dish. As the interior space is 3 7/10 cubic feet, a little over two drachms of formalin is required per cubic foot. This was accepted as a working rule after the following tests had been made in this apparatus: In each of four experiments a set of four germ tubes was placed in a sound rubber glove wrapped as above mentioned and treated the first time with one and one-half ounces each of formalin and normal salt solution, with two hours' firing of apparatus.

Second time, one and one-half ounces of each fluid, one and one-half hours' firing, plus one-half hour drying.

Third time, one ounce of formalin, two ounces normal salt solution, one and one-half hours' firing, plus one-half hour closed.

Fourth time, one ounce of each fluid, one and one-half hours' firing, plus one-half hour closed.

All of these sixteen tubes remained clear except the anthrax tube, in the fourth experiment, which grew.

Twice a test package of the four germ tubes was placed in the bottom of a fruit jar packed with gauze. This was treated once with ten drachms of each fluid and fired one and one-half hours, all tubes remaining sterile; the other time with one and one-half ounces of formalin and three ounces of salt solution and fired two hours, and of this the anthrax grew.

On two occasions a test package with all the germs wrapped in sheets, etc., and treated once with one and one-half ounces of each fluid and fired one and one-half hours, plus one-half hour closed, and the other time with one ounce of each fluid and fired one hour plus one-half hour closed. All these eight tubes remained sterile in the cultures afterward. Again, two finger-brushes sterilized in steam and heavily charged with anthrax spore culture and dried were treated in this formaldehyde oven, with other things, each time with one ounce of formalin and three ounces of salt solution, with one and one-half hours' firing, plus one-half hour closed. In one of these the door of the oven was not closed tightly and a growth of anthrax followed. In the other nothing grew.

This oven is the best thing in which to sterilize rubber gloves, because they are available for use, dry with boric acid as a dusting powder instead of the insoluble and inert

talcum powder, and while the rubber becomes brittle gradually they do not become baggy as they often do when boiled thoroughly. A dry glove is much easier to put on after the spaces under the finger-nails and fine grooves of the skin have been rubbed full of boric powder treated with this gas. It is evident that this powder absorbs and holds much of the gas, which counteracts the infectious elements in the sweat, because its action on the skin will be excessive if the powder is used rather freely. When rubber gloves are treated in steam sterilizers that are effective, in order to have them dry for use, the rubber surfaces frequently stick together in spite of free talcum powdering. All other soft and hard rubber articles are injured in formaldehyde gas much less than in hot water or steam, while leather parts are ruined in steam. Iodoform, boric acid, and other dusting powder shakers cannot be sterilized along with their contents by any other known method, and ordinarily are a very filthy thing in a surgical sense. But by passing through this formaldehyde oven every time after they have been filled they conform to asepsis and are a very useful adjuvant.

Disinfection of Rooms.—For this purpose numerous more or less complicated machines have been invented and patented in this country and in Europe. But they are mostly cumbersome or complicated and too expensive for boards of health to invest in in sufficient number. They are really not needed, because, according to numerous investigators, practical disinfection can be carried out with formaldehyde gas generated by simple means. Among those who have conducted the best investigations and contributed the best information on this important subject in recent years are Werner,[3] Kister,[4] Trautmann,[4] Engels,[5] Roemer,[6] Herzog,[7] Meyer and Wolfert,[8] O. Voges,[9] Ravenell and Gilliland,[10] Kinyoun,[11] Paul F. Mueller,[12] Vaullaird,[13] C. Fluegge,[14] Joergensen,[15] M. von Brunn,[16] and the Illinois State Board of Health.[17] Some of the practical facts elicited from these experiments are as follows: (1) Formaldehyde gas is best obtained from a 40-per-cent solution in water either by spraying it over all the surfaces and objects in a room and keeping it closed for 12 or more hours, or by boiling it diluted several times with water either in an open vessel if inside the room, or in a retort-like apparatus when outside of the room. To prevent polymerization it is well to dilute it about three times with water and likewise to add a little common salt, chloride of calcium, menthol, or glycerin. The Illinois State Board of Health directs one to pour one pint of formalin over three and one-half ounces of permanganate of potassium in an asbestos-covered vessel. (2) The action of formaldehyde gas is greatly intensified by the presence or combination with it of an abundance of water moisture, so much so that some have thought that it was not so much the dry gas, but its watery solution on the surface of things, that was the active agent. (3) Formaldehyde gas also greatly intensifies the germicidal quality of steam. Steam of 70° C. up to 80° C. temperature can be borne by leather articles, according to Fluegge and

[3] Werner: *Archiv f. Hygienie,* vol. l, No. 4, p. 305, 1904.
[4] Kister and Trautmann: *Zeitsch. f. Hygienie,* u. s. w., vol. xlvi, No. 3, p. 379. 1904.
[5] Engels: *Archiv f. Hygienie,* u. s. w., vol. xlix, No. 2, p. 129, 1904.
[6] Roemer: *Beitrage z. Experimentellen Therapie,* vol. vi, No. 3, 1903.
[7] Herzog, H.: *Centralblatt f. Bacteriologie,* etc., vol. xxxiv, No. 2, p. 170, 1903.
[8] Meyer and Wolfert: *Archiv f. Hygienie,* etc., vol. xliii, Nos. 3, 4, p. 171 u. 221, 1902.
[9] Voges, O.: *Centralblatt f. Bacteriologie,* u. s. w., vol. xxxii, No. 4, p. 314, 1902.
[10] Ravenell and Gilliland: *University of Penn. Med. Bulletin,* vol. xvi, April 1, 1903.
[11] Kinyoun: *U. S. Public Health Reports,* vol. xii, No. 5, p. 89, 1897.
[12] Mueller, Paul F.: *Centralblatt f. Bacteriologie,* etc., vol. xxx, No. 13.
[13] Vaillard: *Archiv de Med. et de Pharm.,* vol. xxxix, No. 3, p. 169. 1902.
[14] Fluegge, C.: *Zeitsch. f. Hygienie,* u. s. w., vol. l, No. 3, p. 381, 1905.
[15] Joergensen: *Zeitsch. f. Hygienie,* u. s. w., vol. xlv, p. 237, 1903.
[16] M. von Brunn: *Zeitsch. f. Hygienie,* u. s. w., vol. xxx, No. 2, 1899.
[17] Ill. State Board of Health, Bulletin on Practical Disinfection, Jan. 2, 1906.

Herzog. If such steam is generated from a 1-per-cent formaldehyde watery solution it kills all resistant germs, so that objects which would be injured in steam of 100° C. can be disinfected in this manner. (4) Formaldehyde gas usually acts only on the surface of things, but, by creating a partial vacuum first, it will penetrate better. (5) Formaldehyde gas, when liberated, rises at first toward the ceiling of a room and then descends in constantly diminishing efficiency toward the floor. One investigator has used electric fans to distribute it better. (6) Its action is aided by warmth. Rooms should be warmed to about 60° or 70° F. previous to disinfection. (7) The chemical neutralizing agent of formaldehyde is ammonia. (8) From twelve to sixteen ounces of formalin are needed for every 1000 cubic feet when all apertures are closed. This will kill tubercle bacilli if they are superficially exposed, but all walls, furniture, cases, drawers, etc., require in addition to be disinfected by mechanical and chemical means.

Disinfection of Rooms.—Experiment 1: An attic room was selected containing 850 cubic feet of space, with many clothes closets and drawers, with one small window and a door, both of which were calked carefully. Temperature 70° F. inside. In this and in each of the following seven similar experiments two germ-test packages were exposed, one about one and one-half feet from the ceiling on one side of the room, and the other about one and one-half feet from the floor on the other side of the room, and each about two or three feet of horizontal distance away from the sheet, when that was used to evaporate the formalin, and four to five feet away from the generating vessel, when the permanganate method or the boiling method was employed. Each package contained three unstoppered germ tubes in a little gauze holding, respectively, the colon bacillus, *B. pyocyaneus,* and staphylococcus. In the first experiment thirteen ounces of formalin (one pint in 1000 cubic feet) was soaked up by a bed sheet, which was hung over a clothes-line drawn about four feet from the ceiling in such a way as to bisect the room diagonally. The lowest borders of the doubled sheet reached to about two feet from the floor. The room remained closed twelve hours. In this first experiment the *Bacillus coli communis* of the ceiling test and the colon bacillus and staphylococcus of the floor test showed growths subsequently in the bouillon cultures.

Experiment 2: The same room and arrangement with double the quantity of formalin, twenty-five ounces (one quart to 1000 feet). The room was closed twelve hours. Both ceiling and floor tests showed no growth subsequently.

Experiment 3: Same room and conditions. Thirteen ounces of formalin poured over three ounces of potassium permanganate and the room left closed for twelve hours. Temperature, 70° F. In the ceiling test all three grew. In the floor test the pyocyaneus was spoiled accidentally, but the staphylococcus and *B. coli communis* also grew.

Experiment 4: Same room and arrangement with twenty-five ounces of formalin (one quart to 1000 feet) poured over permanganate. Ceiling test gave no growth. In the floor test the staphylococcus grew.

Experiment 5: Hospital laboratory, 1620 cubic feet in basement. Four half windows and one door, carefully calked. Temperature, 65° to 70° F. Floor and ceiling tests placed as before. Two bed sheets drawn nearer the floor than the ceiling, so as to secure about equal areas around them and about two feet away from the test packages. All germ tubes unstoppered. Twenty-eight ounces of formalin (one pint to 1000 feet) evaporated on the sheets. The room was closed for twenty-four hours. Of the ceiling test the colon bacillus

grew, and of the floor test all three germs grew.

Experiment 6: The same room and arrangement with fifty-one ounces of formalin (one quart to 1000 cubic feet). In both ceiling and floor tests all germs were dead.

Experiment 7: A kitchen and pantry of 2500 cubic feet. One door and one large and two small windows were all made tight. Temperature, 65° F. Floor and ceiling tests placed as in previous experiments, but the cotton stoppers were not removed from the germ tubes, and they were also wrapped with cotton instead of gauze as formerly. Five pints of formalin (one quart to 1000 cubic feet) with three pints of warm water added were divided into two parts of four pints each and placed in shallow dishes over two Roentgen alcohol stoves, having one pint of wood alcohol in each stove, and standing in opposite parts of the room about four feet from the floor. The alcohol flames could be seen through a window to burn one and one-half hours. Of the diluted formalin a thick syrupy sediment remained in the dishes, showing that polymerization had occurred and that not all the formalin had been evaporated in the boiling process, evidently because it had not been diluted sufficiently with water. The room remained closed twelve hours. Of the ceiling test in the experiment the pyocyaneus and staphylococcus grew, but in the floor test package all were dead. It is evident that more water should have been added in this experiment to prevent the formation of a solid residue, and a stronger fire likewise was needed to evaporate the larger quantity of liquid in shorter time so as to secure the greater efficiency of a denser and larger volume of formalized steam acting for a shorter time.

Experiment 8: A large clothes closet with one door and two small windows, 500 cubic feet. One pint of formalin (one quart to 1000 cubic feet) and one pint of water evaporated over one alcohol stove within a wash boiler about three feet from the floor. The room was closed twelve hours. Upper test package yielded no growth. Of the lower package the colon bacillus and the staphylococcus grew.

These experiments are not sufficient in themselves to admit of definite conclusions. As far as they go they indicate that a sheet method of diffusing the formalin is rather better than the others here tried. But it is evidently advisable to make use of two pints of formalin for every 1000 cubic feet rather than only one pint. What the Illinois State Board of Health and all other authentic investigators have laid stress on must not be neglected—*i.e.*, that this disinfection attends only to the air and the superficial surfaces of things in the rooms treated; that upholstered furniture, draperies, unwashable clothing, bedding, etc., should be, in addition, sprayed carefully with formalin or some other chemical disinfectant in solution and then exposed to the open air, the sovereign disinfectant, to eliminate both the odor of the chemical agent employed and the remaining infectious elements. Likewise that drawers, bureaus, cases, floors, and woodwork should be washed with a potent antiseptic solution, like 5-per-cent carbolic acid or formalin, and that the walls should be wiped or sprayed with the same mixture and the apartment opened up for efficient ventilation. To leave the laity under the impression that the disinfecting fumigations alone actually completely disinfect everything in such rooms is a most deceptive and dangerous practice.

OBSTETRIC ASEPSIS AND ANTISEPSIS.[1]

BY JOSEPH B. DE LEE, M.D.,

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Obstetric asepsis and antisepsis preceded surgical asepsis and antisepsis. To speak of surgical cleanliness is an anachronism, for it was an obstetrician who first recognized the cause of infection and who laid down the rules for its prevention. Fifteen years before Tyndall discovered the germs in the air, seventeen years before Pasteur proved that decomposition of liquids occurs when germs gain access to them, and five years before Lister obtained his medical degree, Ignaz Philipp Semmelweis had announced to the world the real nature of puerperal and other wound infections, and had prescribed a successful prophylaxis. Semmelweis knew nothing of germs, but he saw with crystal vision where childbed fever and surgical pyemia originated, and he proclaimed the truth to the world in these words: "I teach that every case of childbed fever arises through the absorption of decomposing organic matter; these deleterious substances are most often brought from the outside to the individual; the carriers of these deleterious substances are the examining finger, the operating hand, the instruments; bedclothes, the air, sponges, the hands of the midwives and nurses, who touch the bedpans of infected puerperæ or other sick, and then come in contact with newly delivered or parturient women. In short, the carrier of the infection is everything that, soiled with decomposing organic matter, comes in contact with the genitals of the patient. In rare cases these deleterious substances may arise within the puerperæ."

"Puerperal fever is not limited to the puerperium, but is the same disease as pyemia, being only a variety of the latter." It is generally believed that Sir James Y. Simpson first compared the puerperal uterus to an open wound and puerperal fever to an infection of the same, but Cruveilhier, long before him, had done this, and Semmelweis, more clearly than either, pointed out the analogy. "You obstetricians, you surgeons," cried Semmelweis, "you have the poison on your hands, on the utensils, the instruments; and, everything else, infection through the air, autoinfection, predisposition, is of little importance." In an open letter to Scanzoni, Semmelweis says that surgeons die from wounds they acquire from infected cases, or as he puts it, from the introduction of decomposed animal matter into accidental wounds.

For the prophylaxis of puerperal infection, Semmelweis demanded, first of all, the disinfection of the hands of the accoucheur and of the nurses, and the sterilization or removal of all supplies or instruments that had come in contact with "decomposed organic matter." Change these three words to the single word "germs" and we have the theory absolutely up to date, and in every way correct. Semmelweis ordered the isolation of infected puerperæ, and those suffering from infectious surgical or medical diseases, and he demanded that the operatives in the obstetric wards shall not come in any way in contact with "decomposing organic matter." In short, he promulgated the doctrine of "non-infection" which only in the last few years is being adequately appreciated. And all this in 1847 and 1848!

Seventeen years later came Pasteur and Koch, who demonstrated the bacteria in Semmelweis' "decomposed organic matter," his

[1] Read before the Chicago Medical Society, May 23, 1906.

"deleterious substances." Nineteen years later came Lister, with his occlusive dressing and carbolic acid spray, fearing the air more than the hands. Then comes a long train of German and French workers, out of which these names may be selected: Trendelenburg, von Bruns, von Mikulicz, Schimmelbusch, Doleris. They all rediscovered and placed on a scientific basis the truths Semmelweis had seen and announced decades before.

However, it is not of the principles and practice of aseptic technique that I intend to speak to-night, though statistics prove that puerperal fever is just as prevalent now as it was twenty and forty years ago. Williams, of Wales, in the Milroy Lecture, 1904, shows that in England and Wales the mortality from puerperal septic disease, in 1901, was 2.24 per 1000, and in 1861, 1.27 per 1000. This is a large and unnecessary mortality, and in addition, the number of cases of severe but not fatal infection is very great, and shows little tendency to diminish. What are the reasons for this continued mortality and morbidity? (1) The principles of asepsis have not yet thoroughly permeated the great mass of the medical profession. (2) The social conditions in which the vast majority of confinements are conducted are not favorable to an aseptic delivery, and the time, effort, and pains required of the physician to force such favorable conditions are not compensated for by the public, either by money or by gratitude and recognition. (3) A small proportion of the deaths from sepsis is absolutely unpreventable by any known human means. In maternity hospitals the mortality has been brought down to the last mentioned class, and the properly conducted maternity hospital is now the safest place for a woman to have her baby.

In recommending a technique to the general practitioner, then, it would be advisable for him to imitate, as far as the condition of the patient permits, and as far as he can force them, the aseptic methods of the most scrupulous maternity or surgical operation room. Let him regard the obstetric patient as liable to infection to the same degree as a patient whose abdomen has been opened and upon whom a laparotomy has been performed.

That it is possible to develop a fine aseptic technique in the home of the patient is proven by the daily experience of the Chicago Lying-in Hospital Dispensary. In this service over 7300 consecutive full-term labor cases have been conducted in the homes of the poor and poorest of the city, with but one death from sepsis. Rubber gloves are used in the conduct of all our work, and as antiseptics we rely on the liberal application of lysol and bichloride, externally.

But there are several principles for the conduct of an obstetric case, which, while they have nothing to do with the killing of germs, are of great influence in obtaining a normal and afebrile puerperium.

1. *During Pregnancy.*—Cure any local disease, as vaginitis, cervicitis, or other infections, as thoroughly as possible before labor supervenes. An appendicitis should be operated on early. The same may be said of salpingitis, the diagnosis of which is harder to make. Instruct the patient in methods of local cleanliness. Forbid coitus and self-examining in the last month of pregnancy.

2. *During Labor.*—Insist on having the best of everything in the house for the confinement. If you do not ask for it you will not get it. Every puerpera is a wounded woman, and infection enters the wounds, and the vital principle of all methods of prophylaxis is to prevent as far as possible parturient injuries.

Limit the number of internal examinations to an irreducible minimum and make them very gently, so not to tear the softened mucous membrane. Conduct the labor, as far as possi-

ble, by external examination. The state of the cervix and the possible prolapse of the cord are the only points in a labor indeterminable by external examination. The writer conducts the majority of normal labors with one internal examination, often without any at all, and rarely two or three. Do not rupture the bag of waters until there is a strict indication for it, and let one condition be a completely dilated os. Avoid all measures to shorten the time of normal labor, as manual dilatation of the cervix, of the perineum, or having the woman bear down before the head has slipped through the cervix. Do not give ergot until the placenta has been delivered. Do not apply forceps until there is an honest, scientific indication for their use. Do not use douches, especially hot ones, or antiseptic ones. These rob the vagina and cervix of their epithelium and their natural protecting secretions. Prevent perineal and vaginal tears, as far as possible, which means a patient conduct of the second stage.

3. *During the Third Stage.*—During the placental stage, the rules for the prevention of infection apply with doubled force. The mortality of the third stage of labor is greater than that of the other two stages combined, and its importance corresponds to the death-rate. Most practitioners, and all students, do not think so, and most text-books treat the third stage in a superficial manner, but the experienced accoucheur and the vital statistics will bear me out in the above statement.

The third stage should be conducted as physiologically as possible. Interference should be instituted only on strict indication; above all manual removal of the placenta should be attempted only when hemorrhage occurs or the structure is pathologically adherent. Great care is to be exerted to obtain the placenta and the membranes complete, as retained portions of either furnish pabulum for the organisms naturally in the vagina, and they retard involution, which, when normally progressing, offers a barrier to infection. The uterus should not be bruised by too early, too frequent, and too strong attempts at Credé expression of the placenta, or too much and too forcible massage.

The placenta and membranes should be carefully inspected to determine if pieces of the former or shreds of the latter are missing. Such an examination consumes five full minutes and should never be neglected. It is the keystone of the treatment of the patient, should fever arise subsequently. The cases in which it is impossible to determine this point are rare. If a piece of placenta is missing, it must be removed at once. If a piece of membrane less than one-half remains in the uterus I usually do not go in after it. If the uterus balloons out with blood, or if there is external hemorrhage, the cause is frequently found to be such a piece of membrane, wrapping up a blood-clot. Removal is then indicated. See that the uterus is empty of blood-clots, hard and firmly contracted, before you leave the house.

4. *After the Third Stage.*—Repair all lacerations of the perineum that are deeper than one-half inch. A large number of cases of infection originate in the perineal wound. It is preferable to do this after the delivery of the placenta, as the parts are not obscured by flowing blood, the tissues are not so swollen and stretched, and one can so arrange the patient that better work may be done. Then, too, if one sews the laceration before the placenta is delivered, the proper conduct of the third stage is neglected, and also the placenta will, as it passes over the wound, force blood between the stitches, which will prevent proper healing. The one consideration of saving the accoucheur's time should not weigh against the above disadvantages.

After every operative delivery and after every breech delivery, and in all cases in which

there has been a rapid dilatation of the cervix, examine the whole utero-vaginal tract for lacerations. You must know, without the least cavil of a doubt, whether or not there is a perforating injury of the parturient canal; you must determine exactly the number and extent of the puerperal wounds. This advice is not given for normal cases, but for operative and abnormal cases.

After the puerpera has been cared for on the lines just indicated, the parturient canal is to be severely left alone. No douches are given. The single indication for douches, in my opinion, is hemorrhage. Before introducing the hand into the uterus in any manipulation, I wash out the introitus and lower third of the vagina with lysol solution and bichloride on cotton pledgets. This is to avoid carrying higher into the uterus particles of feces, etc., which may have reached this point through the various manipulations connected with an operative delivery.

5. *During the Puerperium.*—Leave the woman alone. Make no internal examination, give no douches; practice only external, vulvar antisepsis. If the perineorrhaphy wound becomes infected, remove the sutures and open up the wound. If the puerpera develops fever do not do anything, if you are certain that the placenta was complete. If you are not sure about the placenta it may be necessary to invade the uterus, a procedure at this time fraught with great, often fatal, danger. The importance of having determined the empty condition of the uterus right after delivery may now be appreciated.

In no place in all medical practice does prevention play such a leading rôle as in puerperal infection.

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THE SIGNIFICANCE OF HYDROCHLORIC ACID VARIATION IN THE STOMACH CONTENTS.[1]

BY EVERETT J. BROWN, M.D., DECATUR.

When the new era in the diagnosis of stomach diseases by the analysis of the contents was inaugurated, and it was found that in cancer free hydrochloric acid was usually absent, it was thought that a sure test for this disease had been found, but it was soon discovered that free hydrochloric acid was occasionally absent in other conditions also, notably chronic gastritis and the rare condition of complete absence of gastric juice now known as achylia gastrica. It was then found that cancer usually showed not only absence of hydrochloric acid, but also the presence of quite large amounts of lactic acid. Here, too, we were to be disappointed, for it was found that there could be an entire absence of free hydrochloric acid with a goodly amount of lactic acid in other conditions not cancerous, especially in aggravated cases of asthenic gastritis with great stagnation of stomach contents. Hence, in the diagnosis of gastric cancer, other evidence in addition to the absence of hydrochloric acid and presence of lactic acid must be forthcoming.

Osler records that in ninety-four cases of cancer of the stomach in which the contents were examined, free hydrochloric acid was absent in eighty-four cases; other observers confirm these findings, so that it is safe to affirm that in more than 90 per cent of cases of gastric cancer there is no free hydrochloric acid found. Therefore, the absence of hydrochloric acid in the stomach contents is an important, but by no means a conclusive,

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evidence of this disease, as other members of the symptom-complex, such as tumor, age of patient, anemia, pain after eating, hematemesis, lactic acid, etc., must be present.

Einhorn says that over one-half of the cases of stomach diseases which present themselves for treatment show an excess of hydrochloric acid in the stomach contents. He found the index for total acidity to average over 60, and of these more than half showed an index over 80.

The normal per cent of hydrochloric acid is usually recognized as 0.070 to 0.100, corresponding to the titration figures, 20 to 30. Some authorities put the percentages somewhat higher, but it is well known that in persons having more than this a majority will show stomach symptoms. Occasionally, persons are found with continuous high acidities for months or years, but without symptoms. Normal total acidity varies from 40 to 60, although occasionally it may reach 100 without producing symptoms.

The amount of hydrochloric acid in the stomach may be increased by massage of the abdomen, both in health and in disease. Hence the value of that procedure in subacid conditions, such as gastric catarrh, achylia gastrica, etc., and its injurious effects in hyperacid conditions, such as hyperchlorhydria and other hypersecretions.

It is also well known that an entire absence of hydrochloric acid may exist for years with apparent good health. Cabot says: "Hydrochloric acid is a luxury in digestion and by no means a necessity." In achylia gastrica, a condition in which there is neither free hydrochloric acid, pepsin, nor the rennet ferments, no symptoms may exist for years, providing there is no motor insufficiency. Einhorn reports a case in which for years no gastric juice was ever found, yet perfect health existed, the small intestine acting vicariously. One of Ewald's cases gained forty pounds under treatment, yet with no improvement in gastric juice.

For the last two years I have had under observation a case of achylia gastrica in a young farmer, aged 24 years. In six analyses of the stomach contents extending over that period, at no time have I found the slightest trace of free hydrochloric acid; the total acidity has ranged from 4 to 12, and at all times both rennet and pepsin ferments have been absent. His normal weight had been 150 pounds; at the beginning of treatment he had lost fifteen pounds; after ten months' treatment, with large doses of dilute hydrochloric acid, nux vomica, and dieting, he gained 33 pounds, and continues now in good health.

Cases of gastric neurasthenia will at times show the greatest variation in the free hydrochloric acid index. A young student, under my care in October of last year, showed absence of hydrochloric acid with total acidity of 40; again, in February, no hydrochloric acid, but on May 1 of this year the free hydrochloric acid was 35 and total acidity 66.

Graham Chambers has called attention to the relation of hyperchlorhydria to the so-called "bilious attacks" and to some forms of eczema, also to gout and muscular rheumatism. In many of these cases an excess of hydrochloric acid is found in the stomach contents. In several cases of severe bilious attacks he induced vomiting with apomorphine, and the analysis of the vomit showed a great excess of free acid. He noticed that many cases of eczema were cured by the same alkaline treatment which is given in acid dyspepsia; also that many cases of gout and muscular rheumatism show hyperacid stomach contents. I recall myself two cases of chronic urticaria, which are free from attacks while taking rhubarb and soda tablets.

All physicians who do thorough stomach

work realize that the greatest difficulty is the differentiation of the gastric neuroses from organic disorders. One of the most frequent errors is the diagnosis of almost every gastric neurosis as a gastric catarrh or chronic gastritis, and at times the differentiation is very difficult. As regards the presence of hydrochloric acid in the stomach, it is common to recognize three varieties of chronic gastritis: (1) An excess of hydrochloric acid, known as acid gastritis; (2) a lessened acidity as the disease progresses (the more common form); (3) a condition in which hydrochloric acid is practically or completely absent. One finding, however, is characteristic of all these forms, viz., mucus in greater or less amounts.

There is no disease of the stomach in which the determination of the amount of hydrochloric acid in the contents is of more importance than in the disease known as hyperchlorhydria, or hyperchylia as Hemmeter calls it. This is the typical neurotic stomach and constitutes the largest proportion of the stomach cases seen by the general practitioner. Although the disease may often be diagnosed by the subjective symptoms, such as pain or burning with empty stomach, which is relieved by eating or by soda, and acid eructations, etc., yet in certain cases it is only by a test meal and analysis that an exact diagnosis may be made. Free HCl index of 40 or over is usually present, although in rare cases it may reach even 60, without symptoms. It is in this disease that the routine use of hydrochloric acid as a remedy has done such harm, but there is no disease where the results of proper treatment are more satisfactory.

In dilatation of the stomach the detection of the amount of free hydrochloric acid is of the greatest importance, for this condition exists in three marked forms: (1) Dilatation with normal acidity; (2) dilatation with subacidity or an anacidity; (3) dilatation with hyperacidity. Each form requires a different line of treatment.

It is needless to describe the various tests for hydrochloric acid, as they are found in every text-book, but I wish to speak of the value of urine analysis in the diagnosis of gastrointestinal diseases, and refer also to the Sahli desmoid test. As is well known, the urine is most highly acid before meals and least acid or even alkaline after meals. With a lessened hydrochloric acid secretion, the normal reduction of urinary acidity is lessened or fails altogether. With an excess of hydrochloric acid in the stomach, a marked alkalinity occurs in the urine after meals. In hyperacidity, the chlorides are also much diminished in the urine, and by making a quantitative analysis of the urine by the Purdy centrifuge method much valuable information is obtained, especially if for one reason or another the stomach tube cannot be used.

A year ago Sahli published a new method for testing the digestive and motor functions of the stomach. It is known as Sahli's desmoid test. In a little rubber bag, about the size of a small pea, is placed methylene blue or iodoform; the bag is tied tightly with thin raw catgut. The desmoid bag is swallowed by the patient, after a large meal, and the urine is examined for methylene blue or the saliva is tested for iodine by means of starch paper and fuming nitric acid. The reaction occurs, in healthy persons, in from six to eight hours. If it occurs later or fails entirely, it points to insufficiency of the stomach. Sahli bases his test on the assumption that raw connective tissue is digested only by the gastric juice and not in the intestines. With hydrochloric acid present, together with its accompanying pepsin, the catgut is well digested and the contents of the bag liberated, and the urine or saliva shows the reaction. In conditions of hydrochlorhydria or ulcer of the stomach, the reaction

occurs early, and with hypo-acid conditions, such as gastric catarrh, dilatation, and achylia, it occurs late or not at all.

This method is still in the experimental stage, and, if it should prove to be of value, it will greatly simplify gastric diagnosis and render the use of the meal and stomach tube less often necessary. In the last number of the *Journal of the American Medical Association,* Einhorn speaks of the new test as unreliable, from the fact that the intestinal juices are also capable of digesting the catgut ligature and thus liberating the reagent.

Although not included in the title of my paper, I thought best to refer here to the therapeutics of hydrochloric acid, and incidentally to pepsin, as the latter is generally loaded in the same gun with hydrochloric acid in the shotgun prescriptions of many practitioners. Pepsin we now regard as a therapeutic joke. It is absolutely without value in 99 per cent of the cases in which it is used, and the use of a solution of pepsin containing alcohol is a farce. No other field of therapeutics exhibits so well the simplicity of medical men in allowing the pharmaceutical chemists to educate them on the action and indications for the use of drugs. They accepted the dictum of the commercial traveler that anything which will digest a slice of egg albumin in a test tube will do it equally well in the stomach. Fortunately, however, pepsin is harmless and has its uses as a placebo. Not so with hydrochloric acid, however, the indiscriminate use of which constitutes the "greatest sin of commission" of so many physicians. When we know that nearly 60 per cent of patients coming to us for treatment for stomach symptoms already have too much of this acid in their stomachs, we realize that this 60 per cent would be injured or at least not benefited by the use of this drug. We also know that whenever hydrochloric acid is present there is also plenty of pepsin. When rightly administered, however, there is no drug which yields such useful and often even brilliant results as hydrochloric acid. In all conditions of subacidity or anacidity, such as chronic gastritis, cancer, and achylia gastrica, it is indispensable, while it is useless in ulcer, in hyperchlorhydria, and in other neuroses.

Treatment of Epileptiform Neuralgia with the X-rays.—

The *Lancet* of July 21, 1906, calls attention to a communication by Béclère and Haret, who reported to the Hospital Medical Society of Paris the case of a man with left facial paralysis. For seven years he had suffered from epileptiform neuralgia and had undergone a number of operations. First all the teeth on the left side of the upper jaw were extracted in succession. Then the infraorbital nerve was divided. Excision of the Gasserian ganglion was performed, and facial paralysis resulted. The pains disappeared after six or seven months. Then the superior cervical ganglion of the sympathetic nerve was excised. The pains again disappeared, but returned after five months. Severe attacks of epileptiform neuralgia occurred from ten to twelve times daily. The pains were felt in the alveolar border of the left superior maxillary bone, from which the teeth had been extracted. The *x*-rays were applied through the mouth to the painful region, the neighboring parts being protected by a tube of lead glass. The rays fell on the alveolar border in a position corresponding to the first and second molar teeth. They were applied at intervals of a week. After the first and second sittings there was no improvement, but after the third the pain diminished. After the fourth sitting the pains disappeared and have not recurred. The interval of immunity is now more than a year, a better result than was given by the former severe operations.

SPECIAL ARTICLES.

THE SOCIAL EVIL.

II. DETERMINING FACTORS.

In the first of these essays an endeavor was made to show that human beings inherit as one of their strongest instincts the desire to copulate; that this desire and its unrestrained gratification attracted no attention in primitive societies, but became with the evolution of society and the integration of family ties so at variance with social order as to require careful restriction, the limits of which become more and more narrow with the march of social progress. The passion remains; its gratification becomes difficult. Two means of gratification are recognized—the legal, legitimate, and conventional, through marriage, and the illegal, illegitimate, and unconventional, through prostitution. The former is in perfect harmony with evolution; the latter no less so, for the very factors that make the marital relation a firm and lasting one combine to aid in bringing about an increasing number of temporary ones. To make marriage permanent is to make it difficult; to make it difficult is to defer it; to defer it is to maintain in the community an increasing number of sexually perfect individuals, with normal or, in cases where repression is prolonged, excessive sexual appetites. These individuals with no legitimate outlet for the passions, unable to enter into the permanent sexual unions exacted by society, naturally tend toward the formation of temporary unions, and are the chief and almost inevitable sources of the social evil.

Civilization means the surrender of individual rights for the common good. Civilized society requires that the individual repress his passions to conform with the standards and laws enacted by the will of the majority. Insomuch as this can be achieved civilization may be regarded as perfect; insomuch as it cannot be done it is imperfect. The present prevalence of theft, murder, rape, adultery, fornication, and prostitution shows how incomplete and imperfect our present civilization really is.

Individuals possessing average intelligence and healthy bodies and minds can usually be brought to a realization of the requirements of civilized life, and the majority are content for its advantages to submit to its disadvantages, but those whose divergences from the average are great can with difficulty be brought to do so.

Such intellectually and morally deficient individuals continually menace society in one way or another, and form a large body whose conduct, varying through every degree of irresponsibility, must receive thoughtful attention from the sociologist. That which is expected of normal individuals cannot be expected of them. That which satisfies normal individuals fails to satisfy them, and there is probably no ruling of society in which their divergence is greater than that which has to do with sexual conduct. They chafe against repression, and failing that moral and intellectual force by which the average individual is controlled, move in the direction of least resistance—backward toward the primitive order of things.

The extent to which social evil prevails in any community will be in direct proportion to the number of such individuals it contains—in other words, it will be in direct proportion to the number of individuals whose sexual inclinations exceed their discretionary powers. The danger of the evil will be in proportion

to the number of such individuals for whom nothing is done.

The necessity for doing something by which to overcome or to prevent the evil presents itself early in the life of every individual, for what is more irresponsible than childhood or more thoughtless than youth?

It is surprising how little attention is paid to the sexual education of children. Most children are taught nothing, a few are taught a little. Somehow it seems to be tacitly assumed that their development takes place according to fixed physiological laws, that their minds keep pace with their bodies, and that as the latter usually require but little attention, the former may do the same. Only conventional education is therefore given, and the moral and especially the sexual education is trusted to chance or to instinct, or to association.

This is undoubtedly a mistake, and a source of evil for which parents are responsible. Children are intelligent, inquisitive, experimental, secretive, and observing. They do not allow new phenomena to pass unobserved. They discuss all subjects freely among themselves. They are secretive about subjects forming forbidden topics of conversation, and they are inclined to try forbidden ground. They are fortunately rational and reasonable. From these statements it certainly follows that a proper education upon sexual matters given to intelligent children would satisfy their inquisitiveness by leaving nothing to be investigated, and by giving all an equal amount of information upon the subject take away the need of mutual confidence and secretiveness. It might also diminish the tendency to experiment by suggesting reasons why the consequences of experiment should be feared.

But there are additional reasons why children should be educated and why they should be carefully observed, and this is the occurrence of abnormalities among them.

One of these that merits special attention is progeria or premature sexual development. It is probably most frequent among girls, most troublesome among boys, and results in the paradoxical development of the sexual powers and inclinations in advance of the intellectual faculties by which they are to be controlled. In boys, whose development usually begins about the fourteenth year, it may take place in these unusual cases as early as eight or nine, and its foreshadowings may even be noted earlier. One might not willingly permit a lad of fourteen or fifteen to associate freely and unobserved with little girls of eight or nine under normal conditions, yet we sometimes have the boy of eight or nine with the development of fourteen or fifteen, and must be on the lookout for him. Such boys are usually the leaders in their circles, and have the aggressive characteristics of the male animal well developed. They are not fit companions for either girls or boys of their own age, nor for girls of any age. The child is ignorant of the meaning and of the enormity of his conduct, and simply follows the line of least resistance, but he unwittingly may become the perpetrator of all the sexual crimes—exhibitionism, onanism, seduction, and rape. He is apt to become the admiration of children of his own sex, who fall into error through imitation. It is all mischief, and the children themselves put it down as such, not realizing the enormity of his performances, and usually remaining secretive about them. In this mischief, however, may be sown the seeds of vice that mature in the downfall of many of his companions who continue to amuse themselves by following where he has led.

When the premature development occurs in girls the conditions are usually better because

of their natural reserve and modesty, yet as these characteristics may appear later, prematurely developed girls sometimes educate, victimize, and seduce boy playmates.

For similar reasons children of dissimilar ages, except when members of the same family, should not be permitted too much freedom. The older child educates the younger one and sometimes leads it into mischief. It is not uncommon for little girls to be educated by older boys, who exchange confidences, exhibit their persons, and perform more serious mischief, and in many cases older girls have seduced little boys in the same manner.

Unfortunately all of children's transgressors are not children in years. Adult men and women sometimes prey upon the inquisitiveness of children and win their confidence in order to make use of them for their own sexual enjoyment. Most of these childish errors have for their starting-point the mystery of sex and the curiosity of childhood. If these be eliminated, and a reasonably careful espionage of children and their playfellows carried out, the mischief will be greatly lessened.

But youth is a more dangerous and troublesome period than childhood, and will require further education and enlightenment. Youth is the period when the sexual passions are strong and the controlling forces weak. It is also the time of life when the character is developed and the individual's point of view established, and should therefore be the time when the greatest care should be taken to enlighten the individual upon the principles of sexual life.

It is a curious paradox that determines that one must make the two greatest judgments of his life—that of his occupation and that of his wife—at the exact time that his experiences render him least able to do it intelligently. A careful father overcomes the first of these difficulties by providing his son with a general education that acquaints him with all walks of life and enables him to select that which seems most attractive to him, and then specially educates him along the chosen line in order that he may succeed in it. How much wiser is this than letting the boy drift along in the line of least resistance until accident determines that he take up with some calling for which he has no fitness, or by imitation follows in his father's footsteps.

But is it not strange that with all the advantages of this kind of education before us so little attention is directed toward special education for matrimony? Rarely do even the most intelligent think it worth while to pay any attention to special education for this important social condition, or give their sons and daughters any special instruction in anticipation of it.

In enlightened communities matrimony is a calling—a life business in which one may be happy or unhappy, successful or unsuccessful.

Young men and young women should be taught somewhere and somehow that in civilized life matrimony is the only legitimate means of gratifying the sexual appetites which are at the foundation of what are called sentiments and affinities; that it is a permanent union and companionship in which sexual, intellectual, moral, and spiritual affinities must all play a part. They should be shown that when certain but not all of these affinities are satisfied the result cannot be satisfactory, that incompatibles cannot form permanent unions, and that for perfect and continued happiness to be attained every one of the various factors must be taken into account and every one of the affinities satisfied.

Who does this at present? The parents, thoughtful lest their son mistake his professional or business calling, hasten to marry him to get him settled, and the parents of daughters

to whose comfort and happiness every attention has been paid hasten to marry them where money, family distinction, or social standing will be attained, and both of these hideous errors are too often accomplished to the lifelong misery of the married young people. Careless parents permit their children to drift into sentimental attachments which often terminate no better. Incompatibility of temperament is the great evil of married life. It is folly to marry for convenience; it is equally foolish to marry for sentiment. When sentiment is absent the marriage is truly deplorable, but sentiment alone can rarely maintain happiness.

Civilized life is artificial; we may not follow natural impulses and be happy. "Love at first sight," like "love in a cottage," is all very well for a time—usually a very short time—but our complex civilized life demands permanent matrimonial unions, and to secure such we must forego the pleasures of following nature, must repress the natural impulses, and base our actions upon thoughtful contemplation of the consequences.

It is a crime against society to bring incompatibles together in matrimony and force them to continue to live miserable existences. And the greatest of all the marital incompatibilities, and that which is of the greatest importance to the community, is sexual incompatibility, which often has its beginnings in the ignorance and innocence of the relation of man and wife. Few women know before marriage what is expected of a wife. Men know by instinct, through association learn by their greater freedom of speech, but women are accustomed to silence upon these topics, and only after marriage find out that the marital relation is essentially sexual and not what they expected. Many a refined and modest girl has married to what seems to her a life of indecency and immorality, and from mistaken notions endeavors to counteract the evil by coldness and resistance. Every physician can look over his experiences in practice and point out cases of marital infelicity the basis of which is feminine frigidity, for which the excessively modest education of the wife as a girl and the absence of education as a wife are responsible.

In such cases enlightenment upon the probable dispositions and temperaments accompanying certain physical developments would have helped matters either by interrupting matrimony or by preparing the wife for what was to come.

Many a man looks in astonishment upon his wife's refusal to comply with what he conceives to be his just demands, and the uninformed wife marvels that, denied her embraces, he seeks those of another. Here a lesson may be learned from the courtezan, who, knowing that her single hold upon her paramour is her compliance with his sexual demands, not only yields to him, but anxiously increases her attractiveness to increase his infatuation. Wives should take this to heart. The wife that is to retain her place in her husband's affections should not be less eager to please him than the strange woman. She should never stand off secure in the legality of her position to antagonize him unnecessarily. To do so is to lose him, for unless he is satisfied at home many a man will leave his chaste, beautiful, intelligent, but frigid wife to weep at home while he enjoys the blandishments of prostitutes.

Let us examine more closely the so-called affinities that bring men and women together, and then see how they also lead them apart. By so doing we will come back again to the conclusion that matrimony should be carefully prepared for by special education in order that it may not become prejudicial instead of beneficial.

Other things being equal, every man is attracted by every woman, and every woman by every man. The force of this attraction is in proportion to the attractiveness of the individual, and an analysis of the term attractiveness shows that when unmodified by artificial conditions it means sexual perfection. In civilized life so many new factors are introduced that other attributes of the individual make-up must be considered, but in general, and for all of the purposes of this argument, the fundamental element of attractiveness is sexual perfection. The attraction is operative upon men in the following order: first the face, second the body, third the intelligence. Every man is attracted by a beautiful face, though few are contented with it. If, therefore, to the beautiful face there can be added a perfect form, the attractiveness is immensely increased and the woman becomes desirable as a mate; if to these is added a brilliant intellect, she becomes desirable as a companion, and if added to these are the more subtile attributes of sympathy of tastes and ideals, she becomes desirable as a wife—or life companion.

The attractiveness of men for women seems to differ in that form and intelligence take precedence over face.

Men admire pretty women; women scorn pretty men. Men admire delicate, dainty, dependent women; women admire strong, vigorous, active, capable, self-reliant men.

These are the natural affinities, but in most cases, and for lasting unions, they are not only incongruous but incompatible. They are thoroughly compatible with the primitive state of mankind, where the sexual alliances were temporary and easily secured, but they are incompatible with the civilized state, in which they are to be looked upon as permanent and difficultly secured.

A systematic study of the relation of physical incongruity to domestic unhappiness if made would undoubtedly explain many things that should be considered before the incongruous relations are formed, and might in many cases act as a deterrent upon them.

The nature of these sexual affinities, and the order of attractiveness of women for men as given, explain many of the inconsistencies of sexual life among the civilized. Thus the general attractiveness of all women for men enables us to understand the promiscuity of man in his sexual intercourse, and his willingness to associate in this relation with women so far beneath him in the social scale as to be scorned in any other relation. The double attractiveness of face and body explains the willingness of many men to form alliances of considerable duration with women they could never marry, knowing that so soon as the inevitable disagreements incident upon the diversity of intelligence arises they can free themselves.

These elementary facts also explain the deplorable occasional seductions of refined and intelligent young women by men—waiters and coachmen—far below them in the social scale, simply because of the effect upon the feminine sensibilities of their superior physical and moral force.

In all these cases we see natural forces and primitive impulses antagonizing the artificial forces of civilization and transgressing the restrictions and limitations of social life. It is getting back to nature, or reversion to the primitive state, in which there were no social distinctions, no restrictions or limitations, and where each was free to do as he pleased. Such natural impulses must keep cropping out like the native rocks beneath the cultivated soil, and our chief efforts must be directed to repressing and disguising them as much as possible.

The overcoming of the natural tendencies toward these incongruous affinities is one of

the works in which parents should earnestly engage. Their sons and daughters should be taught to anticipate the effects that certain attributes of the opposite sex will have upon them in order to guard against them. For in the married life they are as injurious as in the single state, and the unions to which they lead as temporary in duration.

But what has this to do with the social evil? Far more than is commonly imagined. We believe that marital infelicity is one of its chief supporters. Just as it is the error of those debarred from marriage, so it becomes the relief of the unhappily married. The unhappily married do not and cannot satisfy one another sexually, for one of the fundamental principles of the sexual act is that it must be a mutual act, only satisfactory when mutual.

We have then in the unhappy family sexually disunited individuals whose passions are kept inflamed by the intimacy of their relation, yet whose appetites are not satisfied. The result is that among that large number whose sexual impulses exceed their discretionary powers relief will be sought for apart from the home, and the social evil supported.

Every unhappy marriage therefore becomes an added menace to society.

This brings us to another important question, that of divorce. What shall be the attitude of society toward the unhappily married? At present when so little education is directed toward the prevention of incompatible marriages—when, indeed, they are rather emulated for social reasons—shall society ordain that those who following custom and precept are misguided into forming them must maintain the enforced unhappiness forever? If so, society sins against itself as much as against the unfortunate victims of its mandates, for it is urging the enforcement of that which is bound to react upon itself to maintain one of its own misfortunes. Legal separations are no solution of the problem. The unhappily married should be divorced. If separated and unable again to marry, the inevitable effects of association with people at large must result in reversion to primitive instincts and a fall from virtue.

Finally, there are certain individuals at large in every community to whom very little attention is paid because of the difficulty of finding them out, namely, the sexual perverts or sexually insane. Sexual perversion or insanity is a secret malady from which many men and a few women, both married and single, suffer. The nature of the disorder is studiously withheld even from the medical man, until the limit of endurance or the acme of misconduct is reached, when the policeman and the jail instead of the doctor and the asylum receive the patient. Sexual perverts are a serious menace at times, because they are not only perverted themselves, but tend to pervert others. Their mischief is also perpetrated upon adults, in most cases, who themselves become perverted, so that each pervert becomes the center of a vicious circle of individuals of an age that makes it difficult to reclaim them even if their tendencies are discovered.

The publicity of trial and the rigor of the jail do not cure. Treatment, not punishment, is what the pervert needs, and this treatment should be prescribed in a retreat where the individual can do no harm to others, and from which he can emerge only when his troubles are at an end, or where he can end his days in seclusion.

BOOK REVIEWS.

THE DYNAMICS OF LIVING MATTER. By Jacques Loeb, Professor of Physiology in the University of California. The Columbia University Press; The Macmillan Company, Agents, New York, 1906. Price $3.00; 225 pp., 8vo.

This book owes its origin to a series of eight lectures delivered upon the invitation of Prof. E. B. Wilson and Prof. H. F. Osborn at Columbia University in the spring of 1902. The aim of the lectures was to give a presentation of the author's researches on the dynamics of living matter and the views to which they led him. In preparing the book a somewhat more complete survey of the field of experimental biology was employed than was possible in the lectures, and the author's address before the International Congress at St. Louis was made use of as an introductory chapter.

The point of view of the author is conveyed to the reader in the opening paragraph of this introduction: "In these lectures we shall consider living organisms as chemical machines, consisting essentially of colloidal materials which possess the peculiarities of automatically developing, preserving, and reproducing themselves. The fact that the machines which can be created by man do not possess the power of automatic development, self-preservation, and reproduction constitutes for the present a fundamental difference between living machines and artificial machines. We must, however, admit that nothing contradicts the possibility that the artificial production of living matter may one day be accomplished. It is the purpose of these lectures to state to what extent we are able to control the phenomena of development, self-preservation, and reproduction."

The author's psychology is founded upon the opinion that "consciousness is the function of a definite machine or mechanism, which we may call the mechanism of associative memory."

The general chemistry of life phenomena is shown to depend upon analysis and catalysis, chiefly brought about by reversible enzymes whose activity is determined in one or other direction by the presence of certain salts. The only difference between these enzymes or catalyses and those employed in chemical factories in the arts is that living machines possess the peculiarity of automatically preserving themselves.

The chapters upon "General Physical Constitution of Living Matter," "Some Physical Manifestations of Life," "The Rôle of Electrolytes in the Formation and Preservation of Living Matter," and "The Effects of Heat and Radiant Energy Upon Living Matter" are full of interesting matter of fundamental biological importance, and replete with the original observations of the author.

An interesting collection of phenomena is included in the chapters upon Tropisms, including Heliotropism, Galvanotropism, Geotropism, Chemotropism, and Stereotropism. It was with surprise that we read that there is no chemotropic influence exerted upon the spermatozoa, but that their coming in contact with the egg is "left to chance."

The best known researches of the author are probably those which have to do with "Fertilization and Artificial Parthenogenesis," and one naturally turns with anticipation to these chapters. The entrance of a spermatozoön into the egg has two kinds of effects which must be kept apart: the first, the starting of the process of development; the second, the transmission of paternal qualities to the new offspring, the hereditary effect. The ciliary motion of the spermatozoön is required to bring the spermatozoön and egg protoplasm into close contact; the entrance of the spermatozoön into the interior of the egg protoplasm is due to surface tension forces. It is not impossible that the entrance of the spermatozoön alters the surface tension of the protoplasm of the egg, making it impossible for another spermatozoön to enter. Not until the nucleus has become dissolved in the protoplasm can a spermatozoön fertilize the egg. About the same time that this is possible it becomes possible to produce artificially membrane formation and stimulate artificial development in sea-urchin and starfish eggs. By altering the density of the sea-water in which such eggs are contained, and by other experimental manipulations, changes appearing to be identical with the early changes following fertilization can be initiated in the eggs. Extracts made from spermatozoa fail to initiate changes resembling those of fertilization. The author believes that the direct and essential effect of the spermatozoön and the methods of artificial parthenogenesis are the starting of a definite chemical process.

In studying hybrids the author found that when the eggs of sea-urchins were fertilized by the spermatozoa of starfishes they developed to the blastula or gastrula stage, then always died. Their death he believes to depend upon some substance contained in the latter that is poisonous to the former.

In discussing sex-determination, and referring to Shenk's theory, the author points out that the nutritive condition of the mother cannot be responsible for it, as

twins are often of different sexes except when they both develop from one egg. In certain hemipterous and orthopterous insects there are two kinds of spermatozoa, which differ in regard to a single chromosome which is found in one-half of the spermatozoa. McClung has shown that this difference in the spermatozoa determines the difference in the sex of individuals developing from eggs fertilized by them, the accessory chromosome being the determinant for the male sex. The chapter upon Heredity, and the succeeding chapter upon the Dynamics of Regenerative Processes, are interesting.

The author curiously holds with Sachs that hypertrophy of one organ when its fellow is lost or diseased depends upon the circulation through it of a double quantity of certain substances which cause the growth of such organs.

It does not seem to us that the evidence accumulated warrants the author's conclusions. It is true that he has collected an interesting amount of information to show, what has long been admitted, that vital processes are chemical and physical in nature, and that they therefore have place according to definite fixed laws, but he does not show how any of the peculiarly vital manifestations can be initiated. It is one thing to take a living thing and make it respond in this or that way to manipulation. Such responses are to be expected, and it is expected that they will conform more and more nearly to rational processes, the more the manipulations conform to the natural agencies with which the organism comes into contact, but for one to expect that life can be artificially created is not warranted from the data presented, and we do not agree with him that "there is, therefore, no reason to predict that abiogenesis is impossible, and I believe that it can only help science if the younger investigators realize that experimental abiogenesis is the goal of biology."

CARR'S PEDIATRICS. The Practice of Pediatrics. By Eminent Authorities. Edited by Walter Lester Carr, M.D. Lea Brothers & Co., Philadelphia and New York, 1906. Price $6.00.

This handsome volume of 1014 pages forms the second of the series on gynecology, obstetrics, and pediatrics which jointly cover the whole of these topics. The first volume, edited by J. Wesley Bovee, was reviewed in the July issue of MEDICINE, page 525. The present volume, The Practice of Pediatrics, forms the second volume of this series, and within a short time the final volume on obstetrics will be issued. The volume on pediatrics has been prepared by well known authorities in America and England. The authors have kept in mind first the clinical picture of each disease, and secondly the best methods for its treatment. In arranging the volume special attention has been devoted to infant feeding and diseases of the alimentary tract, disorders of nutrition, respiration, and circulation, and to contagious diseases; the object being to describe the conditions most intimately associated with diseases in children, and not those which are more common in adult life and found but rarely in childhood. In some sections extra space has been given to methods of diagnosis which are now regarded as essential, but the details of which are not readily accessible. Mooted pathological questions have been omitted, and only so much of the pathology of each disease is introduced as is essential for its comprehension. Overlapping and repetition, so frequently found in composite books, have in large measure been avoided by careful editing. The publishers in issuing these books have designed to cover the entire field of pediatrics, gynecology, and obstetrics. The series may be purchased together, or each volume separately.

The contributors to the volume on Pediatrics are: Isaac Arthur Abt, David Bovaird, Jr., Floyd M. Crandall, Charles Townsend Dade, Edward P. Davis, Charles Godwin Jennings, Daniel J. McCarthy, Matthias Nicoll, Jr., F. John Poynton, Clive Riviere, John Ruhräh, Thomas S. Southworth, George M. Tuttle, and Leroy Milton Yale.

The volume is splendidly issued by the publishers, and contains 199 engravings and 32 full-page plates, many of which are in colors.

BULLETIN OF THE AYER CLINICAL LABORATORY OF THE PENNSYLVANIA HOSPITAL. No. 3, June, 1906. Philadelphia, Pa.

This issue of the Bulletin contains a number of valuable original papers, some of which have been published in the transactions of societies before which they were read, and others in the periodical medical press. The papers are all based on original research conducted in the Ayer clinical laboratory. The first paper is by W. T. Longcope, director of the laboratory, and deals with tuberculosis of the thoracic duct. A paper by G. C. Robinson discusses the bacteriological findings in fifteen cases of epidemic cerebrospinal meningitis, with especial reference to the isolation of the meningococcus from the conjunctiva and circulating blood. This is one of the most valuable papers recently published dealing with this obscure disease. W. B. Cadwalader has a study of the blood in lead poisoning, with a description of the bone-marrow in one fatal case. A contribution to the pathology of carcinoma is by G. H. White, who has studied the growth of carcinoma cells within the muscle fibers in carcinomatous metastases to voluntary muscle. This communication is illustrated by several plates. H. S. Hutchinson has a contribution to the pathological anatomy of syringomyelia, also illustrated by numerous plates. W. T. Longcope contributes

a study of the distribution of the eosinophilic leucocytes in a fatal case of Hodgkin's disease with a general eosinophilia. G. C. Robinson discusses the rôle of the typhoid bacillus in the pulmonary complications of typhoid. The final paper is contributed by W. T. Longcope and W. W. Fox, and is on a comparative study of pneumococci and streptococci from the mouths of healthy individuals and in pathological conditions. The Bulletin is attractively issued and the illustrations are of the highest order. It is gratifying that these valuable papers are collected in a single volume.

Eczema. By Samuel Horton Brown, M.D. Philadelphia: P. Blakiston's Son & Co., 1906. Price $1.00.

This little work of 105 pages is devoted to the study of eczema, its course, diagnosis, and treatment. It contains 146 prescriptions illustrating dosage and local applications. The author in his preface apologizes for being somewhat dogmatic, but certainly in the matter of treatment he allows considerable latitude of choice to the reader. The author defines eczema as an inflammation of the skin, and he says that the disease is never contagious. The varieties are spoken of not as being essentially different, but are necessary to enable one to classify the more obvious lesions. Under the head of causes the writer discusses the usual irritations which lead to this condition. Under the head of pathology he says: "All authorities are agreed that eczema may be regarded as being of the nature of a catarrhal inflammation of the skin." We will admit that this is a rather dogmatic statement. Under the head of diagnosis the writer discusses the usual skin disorders which may be mistaken for eczema. Quite two-thirds of the work is taken up with the discussion of treatment. Eczema seborrheicum is said to be closely related to eczema, though he regards it as a distinct form of cutaneous inflammation, in this respect differing from Unna, who seems to regard most eczemas as seborrheic in origin. Those having much to do with cases of eczema will find the volume useful, particularly from the standpoint of treatment. The large number of formulæ enable one to make a wise selection for the particular case in hand.

A Compend of Operative Gynecology. By William Seaman Bainbridge, M.D., in Collaboration with Harold D. Meeker, M.D. The Grafton Press, New York, 1906. Price $1.00.

This little work of 66 pages is based on the lectures in the course of operative gynecology on the cadaver at the New York Postgraduate Medical School and Hospital. Its primary object is to aid the students to take that course, and it is necessarily brief and incomplete. The operations are presented in the order in which they are usually described to the classes, the arrangement being such as to make the best possible use of each cadaver. The work begins with a description of the modified Alexander operation; then follows a description of excision of the breast as advocated by Halstead and Meyer. Saline infusion, skin-grafting, dilatation, and curettage, excision of the vulvovaginal gland, adhesions of the clitoris, clitoridectomy, perineorrhaphy, and the various other abdominal operations are discussed. There is a chapter on miscellaneous points, and throughout the work there are many admirable suggestions of a practical nature. There is a special discourse on exploration of the viscera, which is a description of the intra-abdominal conditions which are liable to be encountered by the gynecologist who does abdominal work.

International Clinics. Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by A. O. J. Kelly, A.M., M.D. 16th Series, Vol. II. Philadelphia and London: J. B. Lippincott Co., 1906. Price $2.00.

The International Clinics in its last quarterly issue contains 302 pages, made up of a surprisingly attractive lot of original communications. It is very handsomely illustrated, and has an index. The volume is furnished subscribers at the very low rate of $2 per volume. A note which accompanies the volume from the publishers says that this has been accomplished only by turning all of the gains of publication back into improvements. This will be readily believed by any one who has a knowledge of the cost of book making. We shall not enter into any extended comment on the various articles, as many of them will be noticed in our abstract department.

Surgical Suggestions. By Walter M. Brickner, M.D., and Eli Moschcowitz, M.D. Surgery Publishing Co., New York, 1906. Price 50 cents.

This little work of 60 pages is composed of short paragraphs dealing with notes on diagnosis and treatment. It contains in all 250 suggestions grouped under proper headings, and the contents are carefully indexed. The book is bound in heavy cloth, stamped in gold, and the text is printed upon India tint paper with marginal headings in red. We excerpt a few of the suggestions, not with the idea that they are better than others, but to furnish a sample of what is found in the book:

"In cases of unaccountable fever, especially in children, never fail to examine the ear."

"Persistent pain in the arm may be due to a cervical rib."

"Do not be too hasty in making a diagnosis of intercostal neuralgia. With the exception of pulmonary and

pleural conditions ulcer of the stomach simulates intercostal neuralgia more frequently than any other lesion."

"Unless some other cause is evident, don't fail to examine for signs of tabes when an adult complains of pains about the waist, in the back, or in the lower extremities."

"The following are some of the conditions in the presence of which an examination for tabes dorsalis should never be omitted: (1) All primary swellings of the knee- or ankle-joint without apparent origin. (2) Sciatica and lumbago. (3) Deep ulcer on the base of the great toe. (4) Repeated vomiting at various intervals with periods of well-being intervening. (5) Abdominal pains without other evident cause."

"Do not be too hasty in ascribing the cause of pain in the tendo Achillis or Achilles bursa to an ill-fitting shoe. First exclude gonorrheal infection."

"Gastric lavage is the best postoperative anti-emetic."

THE PRACTICAL MEDICINE SERIES. Under the general editorial charge of Gustavus P. Head, M.D. Volume IV, Gynecology. Edited by Emilius C. Dudley, A.M., M.D., and C. von Bacchellé, M.S., M.D. Series 1906. The Year Book Publishers.

Every one interested in the subject of gynecology should have this valuable résumé of the literature of the current year. The authors are especially to be congratulated on its arrangement, which deals first with general principles such as blood-pressure, neurasthenia, insanity, treatment, technique, and new instruments. Then follow the infections and allied disorders, after which come tumors, traumatisms, displacements, disorders of menstruation, and sterility. The work is very handsomely illustrated, containing a large number of half-tones and many line drawings. In the preface the authors say they have striven to present the new and useful additions to the literature of gynecology during the past year, and they would especially refer to the good work which is being done in relation to carcinoma. The extremely radical operations are falling into disrepute, as the results obtained are not proportionate to the greater difficulties and the higher immediate mortality. Greater stress than ever is laid upon early diagnosis, for this means a less radical operation. Numerous plastic operative procedures testify to the activity and ingenuity of gynecologists. Ovarian transplantation is improving *pari passu* with the technique.

BLAKISTON'S QUIZ COMPENDS. A Compend of Materia Medica, Therapeutics, and Prescription Writing, with Especial Reference to the Physiological Action of Drugs. By Samuel O. L. Potter. Eleventh Edition, Revised and Enlarged. Philadelphia: P. Blakiston's Son & Co., 1906. Price $1.00.

Those who are familiar with Potter's Therapeutics will welcome this quiz compend, which has been revised so as to make it accord with the last revision of the United States Pharmacopœia. The work, while it still ranks as a quiz compend, contains 292 pages, which if it were printed with larger type and wider margins would make a volume of considerable proportions. Twelve new articles and forty-three new paragraphs on important drugs have been inserted, and sixteen articles have been rewritten. Much material that has seemed to be unimportant has been omitted.

A TREATISE ON SURGERY IN TWO VOLUMES. By George R. Fowler, M.D. Two Imperial Octavo Volumes of 725 pages each, with 888 text illustrations and four colored plates. Philadelphia and London: W. B. Saunders & Co., 1906. Price $15 per set.

In the May issue of MEDICINE, 1906, page 370, we referred to the first volume of the magnificent treatise on surgery by Fowler. This second volume fully sustains the impressions formed by the first. This volume continues the subject of general surgery, discussing the surgery of the dorsal and lumbar vertebræ, abdominal and pelvic regions, the pelvic organs in women, and the surgery of the upper and lower extremities. The volume closes with a list of authors and a general index for the two volumes. In closing we would call attention to the very large number of illustrations, all of which are original. The most of them are half-tones, and they are remarkable for clearness of outline. The work is a fine example of the publisher's art.

ABSTRACTS.

THERAPEUTICS.

Treatment of Tuberculous Peritonitis.—

GUTHRIE, T. *Practitioner,* vol. lxxvi, Nos. 5 and 6, pp. 642 and 791, May and June, 1906.

There is a wide difference of opinion as to curability of tuberculous peritonitis, due to the different meanings attached to the terms cure and recovery. It is as difficult in tuberculosis of the peritoneum as it is in that of the lung to say exactly when an actual cure has been accomplished. In both the symptoms may abate and the signs of the disease disappear, and yet deposits of virulent bacilli remain which when the conditions again become favorable to their growth will form the starting-point of the recrudescence of the affection. It is this peculiarity that makes the statistics comparing different methods of treatment so faulty. The treatment largely depends upon the form in which the disease presents itself. Broadly speaking, three main types are recognized, the ascitic, fibrous, and caseous or ulcerous. It is easy to recognize the typical forms of these varieties, but many intermediate types are found or one form may pass into the other, as the ascitic into the fibrous form, which may in turn be followed by a caseous variety. As to the value of drugs in this condition, wide differences of opinion exist, but iodine, creosote, and similar remedies have been employed. In 1862 Spencer Wells in doing a laparotomy for a supposed case of ovarian tumor found the condition was one of tuberculous peritonitis. The fluid was evacuated and did not subsequently return. Since then a number of cures have been reported as a result of laparotomy. Simple aspiration is generally regarded as quite insufficient, as the fluid readily accumulates, but such is not always the case, as instances of cure have been reported after a simple withdrawal of the fluid.

In regard to surgical measures most writers are of the opinion that there should be a somewhat free incision into the abdomen, some claiming that one capable of admitting one or two fingers is sufficient, while others believe that the entire hand should be introduced and some air should enter the cavity. After the operation the ascites frequently returns, but the amount of fluid is usually small and is rapidly reabsorbed. It is rare that the fluid accumulates so rapidly as to interfere with the healing of the abdominal wound. Where there are multiple accumulations a number of incisions may have to be made. A number of observers claim that such simple opening of the abdomen without the introduction of antiseptics is the best method, but others claim that antiseptics can be introduced into the peritoneal cavity with advantage. Porter in a recent communication laid stress on air and light in the operative treatment of this condition. He advises that the abdominal cavity should be freely exposed to light and air for from ten to fifteen minutes, and that the light employed should be the strongest available. Treves in estimating the value of medical and surgical treatment came to the conclusion that the best results were furnished by surgical measures, while Hawkins in the examination of 100 cases came to the conclusion that there is but little difference in mortality whether operation is resorted to or not. The writer finds that out of 41 cases admitted to St. Thomas's Hospital 17 were operated on, with a cure in seven, relief in six, and death in four. Under symp-

tomatic and drug treatment cure resulted in 12, relief in 11, and death in one.

Most writers agree that the evacuation of fluid is most important. Unquestionably the exaggerated value which has been placed upon laparotomy has been due largely to the improvement in hygiene and better diet which follows the operation rather than to the surgical intervention itself. The most reasonable standpoint is that medical and surgical treatment are each suited to a certain stage of the disease, and that the time element is of much importance in connection with the choice of therapeutic measures. Medical treatment cannot be begun too early, while surgical treatment may be. The earlier in the course the operation is done the greater the tendency for the fluid to reaccumulate. The acute cases should be treated for three or four weeks medically, and the chronic for six or seven. If after that time no improvement is noted, resort should be had to surgical measures. As a general rule the longer the disease has endured the less amenable is it to medicinal treatment, and the clearer the indications for laparotomy. Nothing is to be gained by the introduction of such substances as iodoform into the peritoneal cavity, and drainage should not be employed unless the fluid is infected with pyogenic organisms. In all ordinary ascitic cases the incisions should be two or three inches long and the fluid evacuated as completely as possible without undue handling of the abdominal contents. Any adhesions which can be easily dealt with may be broken down or divided between ligatures, and any accessible localized collections of fluid evacuated. If the case is an early one and the patient robust, broken-down lymph glands and infected Fallopian tubes may be removed. During the subsequent treatment the patient must get all the benefit of hygienic measures, fresh air, and good feeding. Phthisis is not a bar to operation. Simple aspiration may be employed when the more severe operations cannot be used. In the dry forms of tuberculous peritonitis operation is much less favorable, and some writers condemn it altogether. In the caseous or ulcerous forms it is valueless.

Treatment of Bronchiectasis.—

Box, S. *Practitioner,* vol. lxxvi, No. 6, p. 839, June, 1906.

Much confusion has arisen owing to the term bronchiectasis having been used to include chronic cavities of the lung due to whatever cause. The true bronchiectatic cavity has a continuous lining of basement membrane, and it may be cylindrical or saccular. The trabecular form has been called a false bronchiectasis, and most of the literature refers to this variety. The distinction, however, from a clinical standpoint is of no great value. Little can be done in the way of prophylaxis. The acute dilatation which occurs in children suffering from bronchitis commonly gets well, as does that which occurs in adults in whom there is no permanent change in the walls of the bronchi. In the saccular variety the cavity is made to contract, or in rare instances the contents become inspissated and the walls calcified. Bronchiectasis of long standing is not, strictly speaking, curable, although in many cases the condition can be improved. In most cases the progress of the disease can be arrested and the condition of the sufferer improved, but in inveterate cases the good which can be accomplished depends on the extent of the bronchial lesion and on the condition of the surrounding tissues. The most hopeless cases are those in which ulceration has occurred or in which there is much fibroid change.

In the treatment the pulmonary condition must be considered as well as complications and the improvement of the general health. The postural method is of use in emptying the

cavity. Where the latter is near the base of the lung, leaning over the side of a couch or bed with the hands resting on the floor may bring away some of the secretion. Emetics may also be employed for the same purpose. The fetor may be relieved by the inhalation of antiseptic and deodorizing agents or their internal administration. For inhalation only those substances which excite cough or expectoration are of any service. Eucalyptol, thymol, or oil of pine may be placed in a jug half filled with hot water which is closed by an inhaler. One of the many forms of dry inhalation may be used, the patient drawing the air through a sponge saturated with tar, creosote, carbolic acid, terebene, or iodine. The various forms of atomizers may be used for the same purpose. Any of these methods of inhalation may do good in mild cases, but their action is neither so continuous nor penetrating as the creosote vapor bath. Where this method is employed a small room must be set apart for carrying out the treatment; it must be rendered as nearly air-tight as possible. The patient is placed in the room, having previously stopped the nostrils with cotton-wool and protected the eyes with close-fitting goggles or with watch-glasses fastened over the eyes with sticking plaster. These precautions are necessary, as the vapor is irritating to mucous surfaces. About three ounces of liquid coal-tar creosote is placed in a metal dish, which is heated by a spirit lamp. The vapor permeates the whole of the small room. At first it is sufficient for the patient to remain in the room about ten minutes and on alternating days. Subsequently, however, the duration is increased to one hour every day, and the treatment should be continued for a period of two months. The patient as a rule feels so much benefited by this treatment that he soon forgets the unpleasant effects of the vapor, such as violent coughing.

Another method is by intratracheal injections composed of one drachm of the following solution: Menthol, 10 parts; guaiacol, 2 parts; olive oil, 88 parts; the injection to be used twice daily. The internal administration of antiseptic and deodorizing agents has long been employed, such substances as terebene, tar, creosote, copaiba, thymol, eucalyptol, and guaiacol having been used. They are best administered in capsules. The best results have been secured by the use of oil of garlic in a dose of one-half minim three times a day.

Mechanical treatment is useful in addition to the postural method which has already been described. This consists of expiratory compression of the chest and abdomen. Climatic treatment often reduces the accompanying catarrh. There is little to hope from surgical treatment. The prognosis depends on the complications which arise. The disease may last for years without change in the condition of the cavity. A complete cure is impossible except in acute or slight cases. The chief dangers to life occur from chronic changes going on in the walls or around them from decomposition of the secretions leading to general septic infections. While bronchiectasis is a troublesome disease much has been done in recent years to help it, and we are now able to check the progress of the affection.

Intratracheal and Intralaryngeal Injections.—

HARLAND, W. G. B. *International Clinics,* 16th series, vol. ii, p. 288, 1906.

Many who have given a trial to intratracheal and intralaryngeal injections are enthusiastic in their praise. The reason that they are not more extensively employed is that the treatment must be made every other day or even daily, and the technique is not acquired without some care and patience. As a routine practice they will be disappointing, but reserved for cases with certain distressing symptoms they

will often give relief. As a rule they should be employed in chronic cases when the mucous membrane of the air tract is too dry, when it is covered with tenacious secretion, broken by ulceration, or infected with microörganisms. They are especially serviceable when it is necessary to leave the stomach undisturbed. The injections may be either sedative, expectorant, or germicidal. Injections may be of service in chronic catarrhal cough; chronic tracheitis; eczema; chronic bronchitis; bronchiectasis; bronchorrhea; abscess of the lung; gangrene of the lung; hemoptysis (often a contraindication); tuberculosis of the lungs; and simple, tuberculous, or syphilitic laryngitis. Intratracheal injections do no good, and may do harm in the acute hyperemic stage of any inflammation. Hemoptysis is usually a contraindication. Reflex spasm of the glottis, pneumonia, and pulmonary hemorrhage are the possible complications. Vehicles for intratracheal injections are pure olive oil, commercially pure petroleum oils, such as benzoinol and liquid albolene, Price's redistilled glycerin, and water.

Sedatives: Menthol, 1 to 10 per cent; heroin, 1/24 grain (0.0025 gramme); morphine, 1/8 grain (0.008 gramme); orthoform, 12 per cent; anesthesin, 2 to 6 per cent; chloroform, 5 minims (0.30 Cc.); compound tincture of benzoin, 5 minims (0.30 Cc.); chloretone, 1 per cent; and camphor, 0.5 to 2 per cent.

Expectorants: Creosote, 1 to 2 per cent; guaiacol, 1 to 2 per cent; iodine, sufficient to make a pink solution.

Antiseptics: Oil of thyme, 2 per cent; oil of eucalyptus, 2 per cent; oil of cinnamon, 2 per cent; oil of gaultheria, 2 per cent; salol, 3 per cent; ichthyol, 2 per cent; iodoform, 2 per cent (1/8 grain); and potassium permanganate (1/8 grain). The amount per dose is given in parentheses.

A good mixture is:

℞ Creosote....5 to 10 grains, 0.30 to 0.60.
Menthol....5 to 15 grains, 0.30 to 1.00.
Olive oil.....1 ounce, 30.00.

Mix. S.: Two drachms (7.5 Cc.) to be injected at a dose, daily, every other day, or twice weekly.

To each dose of the foregoing the following may be added: Heroin, 1/24 grain (0.0025 gramme); morphine, 1/8 grain (0.008 gramme), if cough is a prominent symptom; or iodoform, 1/2 grain (0.03 gramme), if expectoration is fetid or contains tubercle bacilli.

It is well to begin with one-per-cent menthol and rapidly increase the strength. Guaiacol may be substituted for creosote, and other combinations of drugs may be made according to the symptoms present in the individual patient. The following formulas have been much commended: Mendel's:

℞ Iodoform,
Guaiacol,
Essence of thyme,
Essence of cinnamon,
Essence of eucalyptus, of each. 5.00.
Olive oil .....100.00.

Mix.

For tuberculosis Campbell uses during the first week of treatment:

℞ Thymol,
Menthol, of each....1 drachm, 4.00.
Salol .....2 drachms, 8.00.
Glycerin (Price's redistilled)..
5 ounces, 150.00.

Mix in a 6-ounce (180 Cc.) bottle. Dissolve on a water-bath. Sig.: Two to twelve drachms (7.5 to 45 Cc.) to be injected twice daily.

During the second week of treatment and later, Campbell uses the following:

℞ Medicinal izal .....3 drachms, 12.00.
Menthol .....2 drachms, 8.00.
Glycerin (Price's redistilled)..
5 ounces, 150.00.

Mix. Sig.: Two drachms (7.5 Cc.) to be injected once daily.

For tuberculous ulceration of the larynx

with painful deglutition the following are recommended:

℞ Heroin hydrochlorate..3 grains, 0.20.
Water .....1 ounce, 30.00

Mix. Sig.: A few drops of a warmed solution to be applied by means of a syringe to the ulcer before meals.

Freudenthal's emulsion consists of the following:

℞ Menthol, 1.00, 5.00, 10.00..... 15.00.
Orthoform ..... 12.50.
Oil of sweet almonds..... 30.00.
Egg yolk ..... 25.00.
Distilled water, sufficient to make 100.00.

Mix and make an emulsion. Sig.: A few drops to two drachms (7.5 Cc.) to be used as a dose.

It is well to begin with one-per-cent menthol, and quickly increase to 10-per-cent. Menthol and orthoform in liquid albolene may be used instead of the emulsion.

Another formula useful in odynphagia is:

℞ Menthol .....1.5, 22½ grains.
Powdered gum arabic,
Oil of sweet almonds,
Distilled water, of each..10.00, 2½ drachms.

Mix, make an emulsion, and add:

Anesthesin..1 to 4.00, 15 to 60 grains.
Brandy .....20.00, 5 drachms.
Distilled water.....60.00, 2 ounces.

Mix. Sig.: Two drachms to be injected into the larynx.

No intoxication need be feared, and anesthesia lasts from three to thirty hours.

The Muir syringe has long been a favorite. It has a flexible curved cannula about seven inches long and holds about four fluidrachms. Some depend upon an atomizer with a down tip, and with it spray into the larynx for from thirty to sixty seconds. As a rule a local anesthetic is not necessary, but where necessary four-per-cent cocaine hydrochlorate solution may be used on a cotton-tipped laryngeal applicator. A one-half- to one-per-cent cocaine solution may be sprayed into the larynx. The injections may be made with or without the mirror. A syringe with a cannula having a half-inch bend may be held just behind the epiglottis, and the syringe discharged during short, quick breathing.

High-frequency Currents in Medicine.—

Wilson, R. *New York Medical Journal,* vol. lxxxiv, No. 3, p. 114, July 21, 1906.

Practically the last word has been said of the ordinary faradic and galvanic currents, but too little is known regarding high-frequency oscillating and high-periodicity pulsating currents. All forms of electricity are identical, differing merely in their form and the physical conditions under which they are produced. A high-frequency current is one of high voltage with tremendous frequency of alternation or oscillation. It is an interrupted alternating current caused by the condenser discharge, and the interruptions by the time it takes the condenser to receive a full charge and overflow. Therapeutically these currents are chiefly valuable in diseases due to malnutrition or defective metabolism, such as neurasthenia, diabetes mellitus, and subacute and chronic rheumatism. In pulmonary tuberculosis it lessens cough, night sweats, and favorably influences the evening rise of temperature. In neuralgia, sciatica, lumbar myalgia, and true hysteria treatment by high-frequency currents often gives excellent results. In the chronic forms of skin diseases, such as psoriasis, chronic eczema, and alopecia areata, this treatment is of value.

In discussing apparatus the writer says too expensive outfits are recommended to the general practitioner. The writer has constructed a static machine of 20 revolving disks of 10 inches in diameter made of glass, and 20 stationary disks of 10 inches in diameter also of glass. Such a machine operated by a one-eighth horse-power electric motor will give as good results as a machine having 30 inches diam-

eter. Such a machine with two large Leyden jars and an Oudin resonator gives as perfect command of high-frequency currents as is needed in general practice. It serves better in making local applications than a large 30-inch disk machine operated at a lower speed and giving a less quantity of current output. Its output is equal to a 16-inch Tesla high-frequency coil, and the item of cost is much less. An efficient machine of this kind can be put on the market for $150, and it will do very efficient *x*-ray work. It will make ordinary radiographs, but not of the hip-joint.

Treatment of Mental Disturbances Due to Autointoxication.—

BRIGGS, L. V. *Boston Medical and Surgical Journal,* vol. cliv, Nos. 16 to 18, pp. 431, 464 and 493, April 19-May 3, 1906.

The writer is convinced that autointoxication plays an important part in the development of many mental diseases. This view is receiving increasing attention, and the older theory that the symptoms of toxemia are an effect rather than the cause of the disease is being questioned. In treating an average case of mental disease due to autointoxication or infection there should be given a tonic before meals, together with an antiseptic with meals and two hours after meals; also daily colonic flushings with normal salt solution and baths of salt water from twenty minutes to an hour at night. The diet should consist wholly of milk at first. Should there be decomposition of food in the stomach, lavage should be resorted to. The antiseptics and tonics can be varied in quantity and kind, according to the individual or the results obtained. In cases in which there has been actual damage to the brain, treatment has shown that the progress of the disease can be stopped, though it is not to be expected that damaged areas will be replaced. Almost every case of mental disease begins with insomnia, and while this is not the cause of the disease it retards improvement, and until normal sleep is established permanent results cannot be obtained. With the elimination of the toxins by antiseptics sleep usually comes without sedatives.

On the Employment of Thiosinamine.—

VOLTKE, V. O. *Meditzinskoje Obozrenie,* vol. lxv, p. 675, No. 10, 1906.

Thiosinamine is an allyl sulphocarbamide ($NH(C_3H_5),CS,NH_2$) occurring in the form of a white crystalline substance, with a faint garlicky odor, slightly soluble in water, readily in alcohol and ether. It was first proposed by Hebra for the treatment of the cicatrices of lupus, and has been since used by various clinicians in the treatment of keloids, scleroderma, chronic psoriasis, inflammatory adhesions, contracture of joints, strictures, etc. The author employed thiosinamine in two cases. One was that of a woman 25 years old, who suffered from a chronic synovitis of the left knee as a result of phlegmasia alba dolens. The knee was enlarged, with very limited mobility, giving rise to considerable lameness. Daily injections of a 10-per-cent solution of thiosinamine in water were made for a month. At the end of that time the lameness disappeared, the mobility of the joint having increased to a great extent. However, in a few weeks the contracture reappeared. The author then commenced to use a combination of thiosinamine and sodium salicylate, each 1 gramme in 10 Cc. of water, which he claims to be identical with Mendel's fibrolysin. The advantage of this combination over the pure thiosinamine is that it is readily soluble in water and painless. The injections were continued for one month with very gratifying results. At the end of nine months the patient is still free from lameness, although there is still some contraction of the joint.

The other case was a woman of 57, who

suffered from contracture of the left elbow as a result of a large radiating cicatrix following a severe burn. After six injections in the neighborhood of the cicatrix the patient resumed the free use of her elbow-joint, which had been practically immobile for eight months. No untoward effects were observed.

The Treatment of Migraine with Special Reference to the Use of Cannabis Indica.—

CARRON DE LA CARRIÈRE, G. *International Clinics*, 16th series, vol. ii, p. 28, 1906.

Emphasis is laid on the fact that the migrainous individual should be a patient during the intercalary periods even if the health is apparently good. In treating this disease the neuroarthritic condition, the organic and functional disturbances, and the causes which give rise to the attack should be sought for. Such patients should drink nothing but water or hot infusions. Beef, mutton, and poultry are the only meats which should be allowed. All sorts of vegetables can be permitted with the exception of those that are acid. When the patient has successive attacks the food may have to be further restricted by the omission of meat. Cannabis indica is especially useful in this condition, and it often acts as a specific in certain forms of headache which are nearly continuous, which begin on awakening and last nearly through the day. Although the headache is not sufficiently severe to interfere with ordinary occupations, it is a serious inconvenience. Such a variety of headache is almost always curable by cannabis indica. It should be given in the form of the extract, one-fourth grain morning and evening, later the dose being increased to one-half grain. If at the end of two weeks there is no improvement the dose may be increased to one grain. In particularly stubborn cases the dose may be raised until relief is obtained or until symptoms of intoxication appear.

Treatment of Surgical Tuberculosis.—

Low, V. W. *Lancet*, vol. clxxi, No. 2 of vol. ii, p. 74, July 14, 1906.

In all cases the open-air treatment should be so arranged as to meet the circumstances and requirements of each particular case. In every case the patient's powers of resistance to the disease should be periodically measured by suitable blood examination (opsonic index). Where the resistance is found low and there is no evidence of an excessive autoinoculation, therapeutic doses of Koch's new tuberculin should be given, the administration being controlled both as regards the amount and frequency by the opsonic index. Where there is excessive autoinoculation, absolute rest and fixation of the diseased part should be prescribed. Where the diseased area is circumscribed and practically cut off from the circulation, efforts should be made to improve the circulation through the diseased area. For this purpose fomentations, mild irritants, light therapy, and general and local massage should be employed. Operative procedures should be directed to the removal of the dead inert material, whether pieces of bone or collections of pus, and should be conducted with the most scrupulous aseptic precautions.

Diphtheric Serum in Cancrum Oris.—

TELFORD, E. D. *Medical Chronicle*, vol. xi, No. 4, p. 221, July, 1906.

A severe case of this disease which was successfully handled by the injection of antitoxin is recorded. It occurred in a poorly nourished girl of seven years, who one month before admission to the hospital was ill with what is described as bronchitis. The girl was not attended by a medical man, but according to the family there was no rash or any affection of the throat. Seven days before admission the mother noticed a black patch on the right cheek. Soon after this the cheek perforated, and the

destruction of the soft parts went on rapidly. On admission the condition of the child was grave; the pulse was feeble and quick, and there was a profound toxemia. The right half of both upper and lower lips together with an area of the cheek were gone, the edges of the cavity being bounded by indurated sloughing edges. The bottom of the cavity was formed by black bone with roughened tooth fangs projecting from the alveolar margins. The edges of the hole in the cheek were cleaned, the loose bone and teeth were cleared away, fomentations were applied, and at intervals of two hours the wound was dressed. Soon after the operation an injection of 2000 units of antidiphtheric serum was given, and this was followed at a short interval by a further injection of 4000 units. For the next seven days a daily dose of 2000 units was administered. Under this treatment there was a striking improvement; the ulceration was completely checked. In ten days the wound was covered with healthy granulations.

The Use of Discarded Street-cars in the Open-air Treatment of Tuberculosis.—

WALSH J. J. *International Clinics,* 16th series, vol. ii, p. 100, 1906.

Reference is made to the use which has been made of old street-cars at the Gabriel Sanitarium in the Adirondacks. About a dozen old horse-cars are arranged in a rather large circle, each of them being fitted up for the accommodation of one patient. In many ways they present an ideal dwelling for those who must live the outdoor life. The experiment of using them has now been in progress for more than two years, and they have given excellent satisfaction. The advantages claimed for them are not only their cheapness, but they admit of segregation of patients. The modern tents which have been adopted for the tuberculous resemble street-cars more nearly than the old tents, which were frequently damp and had drafts along the floors. The advantage secured by segregation is quietness, and the patient can decorate his dwelling to suit himself. In addition a small plot of ground can be cultivated near the car if the patient is to remain during the summer. The exteriors of the cars were not modified in any way, but the seats were removed and the inside wainscoted as far as the windows. The door toward the north was permanently closed and boarded up. One great advantage of this form of dwelling is that they may be thoroughly cleansed and disinfected. While they are economical they should not be regarded as a makeshift, but constitute an almost ideal dwelling during the summer months.

Calcium Iodide in the Treatment of Ulcers.—

STEPHENS, G. A. *British Medical Journal,* No. 2377, p. 138, July 21, 1906.

In April of the current year the writer reported a series of excellent results in the treatment of ulcer by the use of calcium chloride, giving it in 15-grain doses three times a day. The effect of the drug was almost immediate, the ulcers, some of which were gangrenous, taking on a healthy appearance and the granulations forming rapidly. In some of the cases after a period of healthy activity the healing process became slower, and in two or three cases ceased altogether. In chronic ulcers he decided to try calcium iodide. This is a deliquescent crystalline salt which on exposure to the air readily gives off iodine. The dose in Hare's Therapeutics is said to be from 2 to 4 grains. In this case the ulcer was deep, with thickened edges; it had an offensive smell, and had existed for over four years, having an area of three by two inches. Treatment with the calcium iodide was begun April 15, and on May 10 the ulcer was healed. In addition small syphilitic ulcerations about the mouth have been treated with calcium iodide. In one or two patients who found it difficult to take

iodide of potassium the calcium salt gave no trouble. Two cases of malignant ulcers which were very painful and foul-smelling have been for a short time under calcium iodide, with a good result as regards smell, discharge, and pain.

Office Treatment of Hemorrhoids.—

BEACH, W. N. *Pennsylvania Medical Journal,* vol. ix, No. 10, p. 718, July, 1906.

The writer claims that most cases of acute and chronic hemorrhoids can be relieved under ordinary local anesthesia, and with less pain to the patient than that which commonly follows the more radical operation done under general anesthesia. The office treatment of almost all anal and rectal diseases consists in the proper application of local anesthesia. Until Gant revived the use of sterile water anesthesia, ethyl chloride, cocaine, and eucaine were universally employed. The latter two should never be used in a stronger solution than one per cent, and the ordinary strength should not exceed one-tenth of one per cent. The strengths used will depend somewhat on the work to be done as well as the susceptibility of the patient. The more nervous the subject the more difficult the procedure. In fissure the one-per-cent solution of eucaine is to be referred, but in less painful diseases, such as hemorrhoids, prolapse, and fistula, the weaker solutions are best. Sterile water should be used warm, and in sufficient quantity to produce anesthesia by pressure. To both eucaine solutions and sterile water adrenalin solution should be added.

Treatment of Pseudomembranous Bronchitis.—

RABE. *Gazette des Hôpitaux,* No. 74, p. 879, June 30, 1906.

This variety of chronic bronchitis is very rebellious to treatment. Two indications are to be met—one, to get rid of the exudate, and the other to prevent its formation. The first is to be accomplished by ipecac, tartar emetic, and the balsamic expectorants such as terebene, eucalyptus, creosote, and copaiba. Perhaps the most efficient expectorant for the purpose is ipecac and tartar emetic. Iodide of potassium is of great value, as it liquefies the sputum, stimulates the glandular secretion, and sometimes cuts short the bronchial obstruction. Huchard describes a case in which the false membranes had been passed for three years which was cured by iodide of potassium, but the patient suffered a relapse six months after the cessation of the treatment.

Splenic Extract in Malarial Infections.—

CARPENTER, C. R. *Medical Record,* vol. lxx, No. 5, p. 165, Aug. 4, 1906.

It is claimed that this is a true remedy for malarial infections. It is an organic preparation, and special care is needed in its manufacture so that it does not spoil either in the hands of the druggist or of the patient. It is best given in the form of a powder enclosed in capsules. It has the same influence as quinine in malarial infections without any of the bad results. A history of fifteen cases is given in which the splenic extract was used. Associated with the extract is red bone-marrow as a tonic. The splenic extract given without the bone-marrow is often valueless, but combined with it there is prompt action.

Galvanism in Enlarged Prostate.—

SHOEMAKER, J. V. *Medical Record,* vol. lxx, No. 5, p. 178, Aug. 4, 1906.

In hypertrophy of the prostate the galvanic current is of the greatest value. Using the negative pole in the rectum, there is an abundant flow of mucus with a corresponding increase in the caliber of the rectum. The relief of pressure in the congested and tender gland is marked. All that is required is a small wet battery capable of giving about 30 volts.

MEDICINE.

Certain Physical Signs of Heart Disease and Their Interpretation.—

DRUMMOND, D. *Medical Chronicle,* vol. xi, No. 4, p. 216, July, 1906.

The writer discusses certain physical signs connected with the heart and their interpretation. He does not purpose to dogmatize, but offers a certain interpretation as suggestive for future guidance, or until negatived by later experience.

Absence of first sound in aortic regurgitation. In some cases of aortic regurgitation, in which there is no evidence of mitral insufficiency (as revealed by systolic bruit at the apex), the first sound is absent at the apex. Several post-mortem examinations have been made during the last two or three years in the Royal Infirmary, Newcastle-on-Tyne, on cases in which the clinical diagnosis was syphilitic aortic regurgitation, and in which the first sound was absent at the apex. In these the diastolic bruit was usually conducted down the left border of the sternum, and the area of cardiac dulness was vastly increased. The necropsy showed the ventricular cavity to be greatly dilated, and the heart muscle fibroid, whilst the aortic leak was found to be chiefly connected with the cusps on the left side of the aortic wall, the reflex current passing down to impinge upon the mitral curtain. Under these circumstances the explanation of absence of the first sound at the apex was twofold—the heart muscle was abnormal (fibroid), and therefore unable to produce a muscular sound; and, again, the current of blood returning from the aorta into the ventricle tended to close down the mitral valve, and would thus interfere with the membranous snap, and at the same time prevent a reflex current into the auricle. In this connection two points should be recollected: (1) that in cases of great dilatation of the left ventricle, the mitral curtains being comparatively healthy, with incomplete emptying, due to kidney disease, adherent pericardium, or aortic disease (stenosis or regurgitation), it is common to meet with a short, whiffing systolic murmur replacing the first sound; (2) that it is only in cases of dilatation of the left ventricle with healthy heart muscle that the short, sharp first sound to which we have been accustomed to attach diagnostic significance occurs. The suggestion that absence of the first sound in aortic regurgitation might be due to the reflex aortic current impinging upon the mitral curtain and keeping it well down during diastole was made by Dr. W. Simpson, senior medical registrar at the Royal Infirmary, in connection with the case of a man, aged 35, who died in June, 1904, and the subsequent autopsy seemed to bear out this view.

Absence of second sound. It is a good rule to suspect disease of the aortic valves when the second sound is inaudible at the apex in the absence of diastolic murmur. This condition of things obtains in some cases with, and in others without, aortic regurgitation. Further, it is not very uncommon to meet with aortic regurgitation and absence of both diastolic murmur and second sound at the base; or perhaps it would be more correct to say that cases occur in which diastolic murmur is absent throughout the patient's stay in hospital, extending over some weeks.

The causes underlying absence of second sound at the base, and therefore at the apex, are apparently several. In one case of a young man (aged 22), who gave a history of rheumatism, there was a faint systolic bruit at the base, but no evidence from the pulse of stenosis, and neither second sound nor diastolic murmur. Here post-mortem examination revealed adherent pericardium with marked thickening surrounding the base of the aorta, and the aortic valves, which held water, were

thickened and had lost their membranous character. In aortic regurgitation the conditions that seem to interfere with murmur and sound are extremely low blood-pressure, with great dilatation of the left ventricle, and fatty (soft rather than fibroid) changes in the muscle; also the fact that the leak takes place in the middle of the aortic current through an interval left by imperfect meeting of the valves in the center. This condition of heart muscle and special cause of reflux current has been found more than once on post-mortem examination where there was regurgitation with absence of aortic second sound and murmur.

Late systolic murmur. The late ventricular systolic murmur, best heard at the apex or to the right of the apex toward the tricuspid area, has given rise to a good deal of speculation in the minds of clinical observers. It is deserving of a special article to itself; but important subject though it is, it can here have only a brief reference. This peculiar murmur is fairly common, but unfortunately, from the point of view of investigation, is not often audible during the late stages of cardiac diseases; in other words, it is not often met with in association with low blood-pressure. The murmur seldom replaces the first sound, but follows it and runs up to the second sound, so that the cycle might be phonetically represented by the syllables "lupfffdub." In some cases it is exocardiac and functional, and like the so-called cardio-respiratory murmur, may be accentuated when the patient draws a long breath; it then alters in pitch and intensity, and sometimes assumes a musical character. Further evidence of its functional nature in these cases is to be derived from the fact that it varies from day to day, and is often absent when the heart is free from excitement. In other cases, however, this late systolic murmur is permanent, and varies but little; and then it undoubtedly indicates regurgitation, either mitral or tricuspid. When audible in relation to the mitral orifice it is highly suggestive of stenosis, and thus it becomes an important clue in the diagnosis of this condition, for it may be the only physical sign present to attract attention. So far as mitral regurgitation is concerned, this bruit seems to point to a relatively slight degree of insufficiency, a somewhat dilated ventricular cavity, and a comparatively sound heart muscle—conditions that are not infrequently met with in stationary or very slowly-advancing mitral stenosis. The murmur is also present in some cases of chronic granular kidney disease, and when detected in such a case would seem to suggest that the ventricle is dilated, that the valves are somewhat thickened and no longer able to close the orifice completely, but that the heart muscle is still efficient.

It is interesting to note that the late systolic bruit is not infrequently related to the tricuspid orifice; but in this case it is seldom permanent, and appears to point to acute dilatation of the right ventricle. In one recent observation, in the case of a lady of 47, who was the subject of granular kidney with apoplexy, left hemiplegia, profound coma, and Cheyne-Stokes breathing, a loud, high-pitched, post-systolic murmur developed over the right ventricle coincidentally with the disturbed respiratory rhythm, but was only audible during the active respiratory efforts, and vanished during the pause. The explanation of this is obvious, viz., that during the stage of dyspnea the right ventricle was overfull and the safety-valve action of King was in operation.

The chief points then suggested by the discovery of this murmur, if organic, are old-standing disease, frequent association with mitral stenosis, slight degree of regurgitation, enlarged left ventricle, and myocardium still practically capable of emptying the ventricle at each systole.

Tricuspid systolic murmurs. The following points connected with tricuspid systolic murmurs may not be without interest. It is not

generally known that systolic musical murmurs audible over the ventricle are much more commonly tricuspid than mitral; indeed, the mistake is very often made of associating a musical systolic bruit, audible near the apex, with the mitral orifice when it really belongs to the tricuspid. Another point that has not received sufficient attention is the fact that at the tricuspid orifice two distinct murmurs may be produced at the same time—one blowing and the other musical, for example. When there is a difficulty in distinguishing between mitral and tricuspid murmurs some assistance may be gained by getting the patient to draw a deep breath, when it may be noticed that the tricuspid bruit, should the two coexist, becomes high-pitched and loud, and often somewhat musical, whilst the mitral sound remains unchanged. In some cases there is a striking interval between the points at which the mitral and tricuspid murmurs are audible on the chest wall, where the sounds are comparatively pure. This state of things is usually met with in very old-standing mitral disease (regurgitation) of rheumatic origin, and seems to indicate fair right ventricular compensation, or at least only a slight degree of dilatation and tricuspid regurgitation. It may not be of much significance, but I may mention that in the cases in which it was observed symptoms of grave heart failure passed off, and the patients responded well to treatment by rest and heart tonics.

A modified pulse indication. Absence of characteristic water-hammer pulse in cases of well-marked aortic regurgitation is common enough; and the explanation would seem to fall chiefly under three heads: (1) where mitral stenosis coexists with aortic regurgitation, especially in cases in which the degree of stenosis is pronounced; (2) where there is narrowing of the aortic orifice and great dilatation of the left ventricle, with inability to empty itself at each systole; (3) where there is obstruction by aneurism or arteriosclerosis of the innominate or left subclavian arteries, in which case the pulse will not be of the Corrigan type in the radial of the same side as the obstruction.

Systolic rapping sound in arteries. The last point to which reference will be made in these desultory notes and remarks is a peculiar and often very striking physical sign in connection with aortic regurgitation, namely, a systolic rapping or knocking sound, which is often audible in the arteries. Occasionally this sound is well-marked over the aorta, but this is uncommon. On the other hand, the knock can be heard on placing the stethoscope on the peripheral arteries in nearly all cases of well-marked aortic insufficiency, or, if not present, may be produced by pressing on the vessel with the finger just above the stethoscope so as to lower the blood-pressure on the point of investigation. The sound can also be heard in the arteries in most cases of exophthalmic goitre and profound anemia with jerking pulse, so that it cannot be held as pathognomonic of aortic regurgitation, though it is undoubtedly an indication of value in attempting to estimate the degree of regurgitation. It seems to indicate the sudden filling of a low-tension artery, the membranous walls being rapidly put on the stretch. Apparently it is only audible over the aorta when there is extreme dilatation of the left ventricle, the degree of regurgitation great, and the valves and aorta free from marked calcareous changes.

The True Significance of Uric Acid.—

PORTER, W. H. *International Clinics,* 16th series, vol. ii, p. 71, 1906.

The writer in a paper which was read before the Medical Society of the County of Westchester, New York, discusses the subject of uric acid lithemia and lithuria, or what is often spoken of as a superacid condition of the blood. The subject cannot be understood without a discussion of the chemico-physiological details which underlie it. Uric acid is a normal end-

product of proteid oxidation. The proteid molecule after it has served its purpose is further oxidized either in the liver or kidneys. In the renal glands the end-products are urea, uric acid, creatinin, carbon dioxide, and water. The sulphur from the proteid molecule is gotten rid of in the intestinal tract. Uric acid is formed normally and solely by a process of oxidation reduction. The uric acid as such never exists in foodstuffs, is not found in red meat, neither is it found in any of the albuminous constituents of the vegetable kingdom. It can be manufactured from albumin contained in meat, milk, and eggs, or from vegetable albumin. The blood is an alkaline fluid, and if uric acid reached it, it would be converted into a urate.

Chemistry conclusively shows that uric acid does not exist in the blood, though this is often stated to be a fact. That the proteid molecule in its isomeric transition through the system often reaches a condition in which it is more easily oxidized into uric acid than into urea is true. But this is quite a different proposition from one that declares that uric acid as such exists in the blood. That the antecedent of uric acid is highly toxic is certain, and it may be responsible for that wide range of symptoms that are loosely grouped as the uric acid condition. Various protoplasmic structures in the body may act vicariously and convert this proteid antecedent of uric acid into that substance and deposit it in the tissues as an insoluble phosphate or urate of calcium. This vicarious and imperfect oxidation may occur suddenly at various points of the body, especially in the great toe joints, constituting an attack of gout. With this quick formation of uric acid in the cartilage cells there are the characteristic symptoms of a gouty attack. The crystals deposited about the joints are largely urate of calcium. The formation of insoluble salts destroys the irritation and the attack subsides, because the locally deposited urates are insoluble and consequently not irritating as compared with uric acid. Normally the kidneys produce uric acid, but it is rapidly, if not instantaneously, converted into a urate as soon as it is formed.

Primarily uric acid depends upon uric acid reduction, and is not formed synthetically. This view has been opposed by some, but it is supported by the best chemists. That uric acid is necessarily formed normally in the renal cells is unquestionably true, because this is the first and only point in the body requiring the use of this acid. In simple overproduction of uric acid it is still formed in the kidneys, but under profound disturbances of metabolism it is vicariously formed in other structures, notably cartilage cells. An overproduction of uric acid is due to (*a*) defective oxygen supply; (*b*) taking into the system more food than can be perfectly oxidized; and (*c*) disturbances in the action of the nervous mechanism. The lesions and symptoms commonly classed as lithemia, rheumatism, and diabetes are all conditions of suboxidation, the results of an insufficient supply of oxygen. Individual peculiarities determine the nature of the disease. Why in one case it is Bright's disease, in another rheumatism, in a third diabetes, cannot with our present knowledge be explained. Under the conditions of modern urban life as a rule too much food is taken, exercise is limited, and nervous strain is great. While the latter factor cannot be in many cases eliminated, the problem of diet is simple, and as a rule exercise can be obtained. The writer excludes fruits and largely starches, certainly those that are most rapidly digested, from the diet, on the theory that they consume the oxygen which should be preserved for the oxidation of proteids. The best forms of carbohydrates are rice and macaroni. A diet of meat, eggs, and milk with white vegetables does not contain sufficient

hemoglobin-forming elements, hence vegetables such as spinach, lettuce, and green peas must be added. Any idiosyncrasy of the patient in reference to diet must be consulted. In some instances beefsteak, which is the best kind of food, may disagree, but the patient may be able to take other kinds of food, such as mutton.

The uric acid condition is not to be treated simply as a symptom, but one which tells what is going on in the system. If this view is accepted, its output can be regulated, but every case must be studied individually. If we find out the defect and remedy it, the individual will get well. The results should not be looked for too quickly, as a condition which has lasted for years cannot be overcome in a few weeks. A case described by the author presented a marked cachexia, which was finally identified as due to putrefactive disintegration of the food. It was a long time before there was subjective improvement, but the uric acid decreased and the urea rose. The toxic condition did not disappear for a long time.

To ascertain whether the alimentary canal is doing its work the indican test should be employed. If the indican reaction lessens during the treatment, then progress is being made; if on the contrary it grows darker and more intense, the condition is growing worse. To test the overproduction of uric acid a test-tube should be filled with urine and the upper strata boiled after adding three or four drops of a four-per-cent solution of acetic acid. If the urine is normal there will be no uric acid thrown down. If, however, it is produced in too large quantity crystals will be formed. Their number is an index of the condition. The administration of alkalies in this condition relieves the irritating effects of the uric acid by converting it into a urate in the uriniferous tubules, but it does not decrease the production of the uric acid. It simply masks a symptom, but does not cure.

Clinical Value of Accurate Estimation of Blood-pressure.—

GILLIES, S. *Australasian Medical Gazette,* vol. xxix, No. 6, p. 271, June 20, 1906.

The writer has been using the sphygmomanometer for some time in both hospital and private practice. He prefers the Janeway, which is most compact, though Martin's instrument is satisfactory. Both have an armlet 12 centimeters in width. Attention is called to certain factors which must be observed if the readings are to be at all accurate. Mental excitement and attention cause a variation in the pressure, so that the first readings are apt to be too high. In nervous patients it is necessary to take several readings to exclude error. So far as possible the same conditions as regards posture and time of day should be observed in the same patient. It is possible that the diurnal variation of pressure does not exceed 20 millimeters. In healthy individuals the reading taken in the recumbent position is from 5 to 10 millimeters lower than when sitting up. The cases in which the instrument is of the most use are those of high tension, with or without cardiac failure, and in cases of cardiac failure generally. High tension of moderate degree with a sound and vigorous heart may produce no symptoms. Blood-pressure is of only relative importance. An individual whose tension is 140 millimeters may be as healthy as one with a tension of 100 millimeters. It is important to know if tension is high enough to maintain an adequate flow in the capillaries, and sufficiently low to allow a margin of reserve power on the part of the heart to meet the calls of increased pressure. The normal heart is capable of overcoming a pressure many times greater than it is ever called upon to face, even under the greatest strain, but when its power begins to fail the time comes when even a moderate rise in pressure is too great for it to meet.

The symptoms of high tension then are

really those of a tension so great that it does not allow a sufficient reserve force in the heart to meet extra demands made on it. They are headache, sleeplessness, shortness of breath, especially on exertion, attacks of dyspnea, so-called cardiac asthma, cyanosis, giddiness, fainting attacks, precordial pain or angina pectoris. In such cases the sphygmomanometer is of great help both from a diagnostic and therapeutic point of view. It establishes the fact of high tension and points to the need of reducing the heart's work. To a certain extent it is also a guide to treatment. In a case observed by the writer there was shortness of breath on exertion, a feeling of giddiness, occasional pain in the left shoulder running to the elbow, much dyspepsia, occasional attacks of syncope. The apex beat was in the nipple line in the fifth space. The systolic blood-pressure was 188 millimeters. After three weeks on nitroglycerin 1/100 and strychnine 1/30 four times a day, he lost all pain and there was no giddiness. The systolic pressure had fallen to 160 millimeters, and the apex beat had come in half an inch. It is unwise to reduce the pressure beyond the point where the circulation is adequately carried on.

In cases of chronic interstitial nephritis with symptoms of chronic uremia reduction of tension by the continuous use of nitroglycerin, dieting, and purgation frequently causes marked improvement. A reduction of pressure from 210 to 140 millimeters was obtained in a case in which there was constant headache and mental hebetude, followed by a disappearance of the symptoms. That the variations in pressure while under treatment have only a relative value is shown by the fact that often there is a marked improvement in the symptoms when vasodilators are given, and yet no actual fall in the recorded pressure. A possible explanation is that while not reducing the actual pressure the exhibition of vasodilators prevented paroxysmal increase of tension which determined the attacks. This at any rate seems probable in any case of recurring anginas with marked cyanosis and edema of the lungs during the attacks.

Syphilis Associated with Pulmonary Tuberculosis.— PRYOR, J. H., *Medical Record*, vol. lxx, No. 3, p. 93, July 21, 1906.

Attention has not been devoted to the simultaneous infection with these two diseases which they deserve. During the last two years the writer has seen fifteen cases of syphilitic disease associated with pulmonary tuberculosis. In every case there was a frank history of syphilis, and the diagnosis of tuberculosis was confirmed by finding the bacilli in the sputum. The time which had elapsed since the appearance of secondary symptoms varied from one to fifteen years. Eight exhibited syphilitic lesions, and seven showed symptomatic manifestations which promptly responded to the therapeutic test. Of the fifteen cases suffering from the double infection, twelve were regarded as incipient and favorable and three were regarded as advanced. A persistent rise in temperature which is not reasonably accounted for by the local tuberculous lesion may raise a suspicion of syphilis. The effect of treatment upon the fever was most marked. In two instances the temperature dropped to normal in four days, and in the remainder it dropped to normal, or 99°, in eight days.

The dual infection has a less unfavorable prognosis than is commonly stated in the literature. Eight of the patients apparently recovered from the tuberculosis, and in seven the disease was arrested. The difficulties in the administration of the iodides to the syphilitic and tuberculous patient have been exaggerated. This is especially true of patients afflicted with incipient tuberculosis. Iodide of potassium was given in solution or with the essence of pepsin in doses ranging from 5 to 50 grains three times daily, and was not fol-

lowed by any more disturbance than is usually encountered when syphilis exists alone. Careful attention was paid to the behavior of the tuberculous focus in the lung with reference to the iodide of potassium. In one instance the moist râles and the expectoration were increased, but in all others no change of this character was detected. An interesting history is detailed in which the confused clinical picture incident to the two infections is described. Attention is called to the fact that pulmonary tuberculosis is often held to be responsible for manifestations of disease which are due to other causes.

Clinical Significance of Indoxyl in the Urine.—

BRUCE, L. C. *Journal of Mental Science,* vol. lii, No. 218, p. 501, July, 1906.

There are two views regarding the origin of certain mental symptoms—one which regards the mental disease as primary and the associated physical disturbances as secondary, and the other that looks upon the physical disorders or the so-called self-poisonings as a cause of the mental phenomena. The writer has confined his study to that form of self-poisoning in which indoxyl appears as indican in the urine. This substance is derived from decomposition of albumins in the intestines. The test he employed was the usual one, in which an equal quantity of strong hydrochloric acid is added to one-third of a test-tube of urine and 1 to 2 cubic centimeters of chloroform and a drop of a one-half saturated solution of calcium chloride. The chloroform takes up the indigo and falls to the bottom of the test-tube. Care must be taken in adding the oxidizing agent that too large a quantity is not used, as an excess discharges the color. When indoxyl is present in excess in the urine the color becomes dark-blue or even black; when it is absent the chloroform is colorless. Between these two conditions there exists every shade of color. Any shade of blue over medium or cobalt is a pathological excess. Townsend says that indoxyl is excreted to excess in depressed states, and the patients with this substance in the urine in excess exhibit symptoms of toxemia. In states of mental exaltation there is seldom any increase, and the amount of indoxyl bears some relation to the severity of the mental symptoms.

The writer has not been able to confirm all of these conclusions. Out of five cases of acute melancholia an excess of indoxyl was found in one. The four cases which showed no indoxyl, or only a trace, had upon admission the large intestine emptied by enemata. A fifth case, however, suffered from symptoms of acute toxemia, and was so confused and difficult to manage that the nurse was unable to administer an enema. The bowels moved regularly. For three days the urine gave almost a black reaction when tested for indoxyl. The day following the enema scarcely a trace of indoxyl was to be detected in the urine, and the patient immediately became quite rational. In three cases of circular insanity indoxyl was present in slight excess, but was removed by the use of enemata combined with a purely milk diet. All these patients improved under treatment. In three cases of hebephrenia indoxyl appeared in the urine of one coincident with the onset of an attack of depression with symptoms of toxemia. The indoxyl disappeared the day following the administration of a large enema, and the depression passed off. Three cases of general paralysis showed no indoxyl in the urine, and one of these patients was distinctly depressed. The total number of patients was 27, of whom 13 were depressed, and of these five had a marked excess of indoxyl and three had a slight excess. All of these were benefited by treatment which reduced the indoxyl, but in only one was there sudden improvement.

The observations show that there is some connection between indoxyl in the urine and mental depression, and the evidence is decidedly

in favor of the indoxyl being a cause rather than a result of the depression. It is certain that not all cases of melancholia suffer from indoxyl poisoning, but this only shows that there may be other forms of self-poisoning which will alter the functional activity of the nerve cells. An excess of indoxyl in the urine means a loaded alimentary tract, which should at once be treated by large enemata and by placing the patient on a dietary of milk and farinaceous foods.

A Case of Hysterical Paralysis of the Facial Nerve.—

VERZILOFF, V. M. *Meditzinskoje Obozrenie,* vol. lxv, p. 535, No. 8, 1906.

The author reports a very interesting and unique case of hysterical paralysis of the facial nerve in a woman 57 years old. The symptoms observed were typical of paralysis of the upper and lower branches of the right facial nerve. The angle of the mouth was drawn to the left, the right eye could not be entirely closed, the furrows on the right side of the forehead were obliterated, and the right eyebrow lowered; there was inability to extinguish a candle even at a close distance. The electrical excitability remained intact as well as the special senses. The only point against this diagnosis was the presence of all the facial reflexes on the affected side. From the history of the case it appeared that the patient came of a neurotic family, and she herself has suffered from hysterical attacks. At one time she had paralysis of the right leg following some mental excitement. The paralysis lasted for one month. Six months later she was affected with supraorbital neuralgia, which developed upon reading an unpleasant letter, and which lasted for three weeks. Several years later she developed paralysis of the left arm and leg upon learning of her aged father's second marriage. This attack lasted about two weeks. The present condition developed also as a result of mental perturbation. The treatment consisted in the application of the galvanic current and proved entirely successful.

Recognition of Albumin Bodies in Urine.—

HASTINGS, T. W. *Medical Record,* vol. lxx, No. 1, p. 13, July 7, 1906.

Reference is made to the fact that the term albuminuria is loosely used to designate the presence of any albumin body in the urine which responds to the tests for albuminous material. It is possible to have in the urine several kinds of albumin bodies. The ordinary tests such as nitric acid, or this acid plus heat, may throw out nucleoalbumin. In order to test the presence of serum albumin, which is alone an evidence of pathological states, the best test is the use of a saturated solution of sodium chloride acidulated with 5 to 10 drops of 50-per-cent acetic acid. Mix the urine with such a solution and boil the upper one-third of the urine. Any pathologic albumin will be precipitated. If this test is carried out in a routine way much more satisfactory and reliable results are reached than by the older methods of testing for albumin. It is important to examine the urine within six hours after it is gathered, otherwise the products of bacterial disintegration may interfere with moderate reactions for albumin.

Reflex Symptoms and Referred Pains Caused by Stone in the Kidney.—

BRADFORD, S. S. *Medical Record,* vol. lxx, No. 3, p. 95, July 21, 1906.

The history of a patient is given whose principal symptoms were nervous exhaustion and pain and weakness of the lower extremities, movable right kidney, pyuria, retroversion of the uterus, and defective circulation of the lower extremities. No improvement had resulted from change, travel, rest, and various methods of treatment. The patient was a woman 32 years old, a librarian, and the family

history was negative. The mental condition was excellent. A thorough examination was made in order to detect if possible evidences of organic trouble. It was found that while clear, amber urine flowed from the right ureter, a thick, whitish fluid came slowly from the left. An *x*-ray confirmed the diagnosis of kidney stone, which was proved by operation to be correct. The patient died on the third day after the operation. It is suggested that the irritation in the kidneys or pancreas or both caused the referred pain and a reflex spasm of the vasomotor nerves derived from the lumbar and upper sacral segments. This caused contraction of the blood-vessels in the lower extremities with an ischemia of the nerve endings, which accounts for the deep-seated pain and the muscular weakness.

SURGERY.

The Radical Cure of Femoral Hernia.—

BALDWIN, A. *Lancet*, vol. clxxi, No. 3 of vol. ii, p. 150, July 21, 1906.

The writer has performed an operation for femoral hernia which he describes some twenty times with excellent results. A curved incision from one and one-half to two inches long is made over the saphenous opening. The sac is isolated and cleared of fat, and the hernia reduced if it is down. A slightly curved director is then introduced in the crural canal in front of the sac, and when its point is behind Poupart's ligament it is moved laterally so as to strip off the peritoneum from the posterior surface of the transversalis fascia. The point of the director is then pushed upward and tilted forward so as to make the aponeurosis of the external oblique muscle project about half an inch above Poupart's ligament. A small transverse incision is now made through the aponeurosis parallel to its fibers onto the point of the director which is pushed through the opening. A small, slightly curved bulbous forceps is introduced through the opening, passed behind Poupart's ligament, and brought out at the saphenous opening. After this is done the director is withdrawn; the fundus of the sac is then seized by the forceps, dragging the sac out through the opening in the external oblique aponeurosis. The neck is then ligated. By this maneuver no pouch is left in which recurrence may take place. A chromicized catgut suture is then passed through the fundus of the sac and drawn through to its middle and then tied, thus leaving two free ends of equal length. One end is now threaded in a long, curved needle and is passed backward and forward through the sac several times, starting at the fundus and finishing at the neck. The needle is then grasped in forceps, and its point passed through the hole above Poupart's ligament through the neck of the sac down to the transverse ramus of the pubes. Then by a turn of the wrist the point is made to slide upward across the pubic bone and to pierce the pectineus muscle and appear through the inner part of the saphenous opening. The needle is pulled through, bringing its thread with it. By drawing on the thread and by tucking the sac back again through the hole above Poupart's ligament by means of a stout probe or similar blunt instrument, the sac disappears and comes to rest in a puckered condition behind the transversalis fascia and at the top of the crural canal, which it effectually roofs in. The other end of the thread hanging from the hole above Poupart's ligament is tied firmly but not too tightly to the thread which projects from the saphenous opening. This fixes the sac in its place and attaches Poupart's ligament to the pectineus muscle, obliterating the crural canal. If necessary a second suture may be put in nearer the pubic spine. A suture closes the opening above Poupart's ligament and the skin incision is closed. The advantages of this operation are that the sac is ligatured higher

up than is possible by the ordinary method, and there is no peritoneal pouch left. The sac is used to roof the crural canal, and Poupart's ligament is approximated to the pectineus muscle, further obliterating the canal.

Cancer of the Rectum.—

GANT, S. G. *New York Medical Journal,* vol. lxxxiv, No. 3, p. 111, July 21, 1906.

Cancer of the anus, rectum, and sigmoid is seen by the proctologist far more frequently than is generally supposed. Carcinoma of the rectum constitutes about four per cent of cancers. It is most frequently encountered between 40 and 60, thereafter the number diminishing in frequency. The disease is of about equal frequency in men and women. Carcinomas are far more frequent than sarcomas. There are two distinct types of rectal carcinoma—the flat, squamous variety known as the epithelioma, and the cylindrical or adenocarcinoma. The former is always found at or in close proximity to the anal margin, while the latter is usually located in the anal canal, upper rectum, or sigmoid. Of 100 cases 5 per cent are of the squamous variety located in the anal margin, and the other 95 per cent are the cylindrical-celled type situated as follows: 50 per cent in the ampulla, 20 per cent in the upper rectum, 15 per cent in the upper rectum and sigmoid, and 10 per cent in the anal canal. When examined early the gross appearance of a cylindrical-celled carcinoma is that of a small, movable, rounded or flattened indurated swelling with elevated center in the submucosa. As it increases in size the neoplasm involves and becomes inseparable from the mucous and muscular tunics of the bowel. The growth may extend in any direction, and from the form it assumes may be classed as annular, tubular, or protuberant. Deposits are common in both forms of rectal carcinoma, but the adenocarcinoma involves the retroperitoneal, sacral, and lumbar glands, while in the squamous-celled or anal variety the inguinal nodes are involved.

In the earlier stages of malignant disease of the rectum the symptoms are vague. At first there is no pain, bleeding, discharge, or obstruction, and the patient only realizes a sense of uneasiness, which occurs some little time after the beginning of the growth. For this reason a definite time of onset cannot be obtained. As the growth advances the symptoms are of a more pronounced character, such as weight and fulness of the bowel or in the pelvis, when the growth is high up. At this time there is some uneasiness during defecation, and discomfort in the sacrococcygeal region and sometimes in the legs, which is frequently attributed to hemorrhoids, fissure, or sciatica. There is frequently a sensation as of something in the bowel, and defecation becomes less frequent, is more prolonged and difficult. Constipation later alternates with diarrhea. Liquid and semisolid feces are often discharged around the solid fecal mass, which is retained by the growth until it is softened by cathartics or washed out by enemata. When ulceration takes place the feces are mixed with mucus, pus, and blood, the amount of hemorrhage depending on the extent of the ulceration. The evacuations sometimes contain portions of growth which have sloughed off. The discharges frequently have a very foul odor, but this latter symptom is of less importance than some writers attach to it. The anal margin is excoriated, and if the rectum is not properly cleansed abscesses and fistulæ may form. When the cancer is located in the anal margin pain is an early symptom, but when it is higher up pain is usually not great until it involves the nerves and attains such a size as to produce considerable obstruction, at which time suffering is intense. There are then constant bearing-down pains and an unceasing desire to empty the bowel. In addition there may be reflected pain in the neighboring organs or

down the limbs. When the disease extends to neighboring organs or involves the sacrum and coccyx the pain is intense.

The diagnosis of rectal cancer is not difficult if a thorough systematic history is taken and a digital and proctoscopic exploration made. The majority of malignant growths of the anus or rectum are within reach of the finger and are readily recognized by their irregular, hard, or nodular formation, or when they have begun to break down by their superficial or deep crater-like ulcers. When the growths are situated high up they can be exposed by the sigmoidoscope, and with a proper light their size, dimensions, and location can be ascertained.

The prognosis of malignant growths of the rectum is very grave. Palliative measures are useless, and the *x*-ray or radium have as yet given no useful results. Early radical operation cures 16 per cent. Only about two-thirds of the cases of rectal cancer when first seen by the surgeon are operable. While the operations are difficult and the mortality high, and the number of recoveries is small, nevertheless it is the duty of the surgeon to do a radical operation wherever and whenever it is possible.

Ethyl Chloride: Its Uses and Abuses.—

CHALDECOTT, J. H. *Clinical Journal,* vol. xxviii, No. 16, p. 253, Aug. 1, 1906.

The writer gives a brief history of the introduction of ethyl chloride as an anesthetic, and refers to the conclusions advanced by him in a paper published in October, 1903. These are as follows: (1) It is the best anesthetic known for single-dose cases, those in which anesthesia is induced, the mask removed, and the operation performed without further administration. (2) It is worthy of extensive trial in all minor operations. (3) It is a safe and rapid means of inducing anesthesia as a preliminary to chloroform or ether narcosis. (4) While its effects are transient it is a powerful anesthetic and should be carefully administered, and the patient properly prepared. Since that time a much greater experience has not materially altered his opinion, and he still adheres to the first proposition, that it is the best single-dose anesthetic, particularly for children. For adults of the ordinary type nitrous oxide is the best. In adults for certain operations on the eye, mouth, and nose which cannot be satisfactorily performed under non-continuous gas anesthesia, ethyl chloride either alone or combined with gas has proved a valuable addition to the measures at the command of the anesthetist. In operations for enlarged tonsils and adenoids, where the chloroform mortality is exceptionally high, ethyl chloride is the best anesthetic. For single-dose cases in adults, except in case of big, muscular men, he prefers the nitrous oxide and ethyl chloride mixture. Equally as good results can be obtained with smaller doses of ethyl chloride as when the drug is administered by itself. The mixture is an ideal anesthetic for cases requiring anesthesia of from forty seconds to two minutes.

Ethyl chloride has now had an extensive trial in minor operations, and it has in some hands given very favorable results. There is no advantage in continuing the administration of ethyl chloride after the first few minutes of anesthesia. It is more difficult to keep up a level type of narcosis with ethyl chloride than with either ether or chloroform, the extreme volatility of the drug making it difficult and irksome to administer methodically. There is no advantage, as the after-effect of continuous anesthesia with ethyl chloride is similar to that of chloroform. The writer feels less confident of the safety and rapidity of ethyl chloride as a preliminary to chloroform and ether. In some hospitals the ethyl-chloride-ether sequence has become so popular that it has superseded the gas-ether sequence. Some of the deaths and untoward results which have occurred under the ethyl chloride administration

may have been due to too large dosage, and hence are preventable. Gas-ether sequence is devoid of danger, and hence should have the preference. The objection of uncertainty of action is not valid if the ethyl chloride is given with a closed inhaler. There is no other agent which will produce anesthesia in so short a time. It is claimed that there is a stage of muscular ridigity more pronounced than with other anesthetics. This is true of all anesthetics, but one of the most striking characteristics of ethyl chloride is its power of practically abolishing this stage by the rapidity with which it induces complete flaccidity. An objection that the after-effects are often severe in relation to vomiting, headache, and postanesthetic faintness has been advanced, but these effects are largely due to a want of special preparation of the patient.

Treatment of Tetanus.—

COLEY, T. B. *Detroit Medical Journal,* vol. vi, No. 6, p. 187, June, 1906.

The writer urges that the treatment of tetanus should be carried out more hopefully than is now the case, and too much reliance should not be placed on any one method. Prophylaxis is of overwhelming importance in the management of this disease. The most of the cases which develop could have been prevented by proper surgical treatment of the wounds. Every wound possibly infected with this germ should be cleansed of all foreign matter and disinfected with an approved germicide. It should be treated as an open wound, to all parts of which the air should have free access. Disinfecting agents which cause an eschar should be avoided. All blank-cartridge wounds, where infection is especially to be feared, should have the antitoxin used, giving 10 cubic centimeters each day for three days. Where the wounds are extensive and it is possible to cleanse them, the antitoxin injections should be made into the muscular tissue near the wound until the latter is in a thoroughly healthy condition. Thoroughness in the treatment of the wound was illustrated in a case in which a shallow blank-cartridge wound was curetted until nothing but healthy tissue was left. Grave constitutional symptoms persisted, but there was nothing suspicious in the appearance of the wound. This led to a deeper incision being made, which revealed some fragments of clothing, from which the tetanus bacilli were cultivated. There was no sign of inflammatory reaction in the tissue about these fragments, but prompt recovery followed their removal. Similar conditions may exist more often than is supposed. Amputation should be seriously considered where the wounds are extensive or multiple. Such operations should be done early, but it is never too late to try them unless the patient is moribund.

The uncombined toxins should be neutralized and the cell toxin broken up. It is probable that the statistics of the antitoxin treatment do not do it justice, because of faulty methods of administration or insufficient dosage. Of the various methods of administration, lumbar puncture, wounding of the cord or cauda, intraneural and intramuscular injections, as well as the local use of the tetanus antitoxin about the wound, the writer believes should all be employed, and in addition intravenous injections should be made to neutralize the circulating toxins. Certainly the intravenous injection should be employed, and the injections should be made freely about the wound. The value of the other methods is somewhat problematical. The dose of antitoxin if given at all should be large, not less than 50 to 75 cubic centimeters daily. Where the site of infection is unknown or where it cannot be reached, large doses are required for long periods to neutralize the toxin which is continually being formed. Baccelli's carbolic

acid treatment has shown in his hands excellent results, but in thirteen American cases there were eight deaths. It is probable that the tetanus infection of Italy may not be as severe as that in this country. Certainly the blank-cartridge wounds which furnish such a high mortality in this country are not found in Italy.

It should never be forgotten that tetanus is a self-limited disease, and if the patient can be kept alive recovery will take place. The minimizing of the spasms plays an important part in keeping the patient alive. Good nursing is most important, and absolute quiet should be insured. Both light and noise should be excluded, and unnecessary handling of the patient should be avoided. In the serious convulsions chloroform should be at hand and administered promptly. The patient should never be left alone. In some cases the tetanus spasms have been controlled by the injection of morphine and eucaine into the subdural space. The experience of Blake in the use of magnesium sulphate for the same purpose is worthy of further study.

Renal Decapsulation and Laparotomy in the Treatment of the Serous Forms of Eclampsia.—

Pousson and Chambrelent. *American Journal of Urology,* vol. ii, No. 10, p. 381, July, 1906.

The writers recognize the importance of medical treatment in eclampsia and offer the idea of surgical interference only as a resource in cases which do not yield to the usual treatment. There are instances of serious intoxication which resist all medical means. Such cases are characterized by a decrease in urea, a large quantity of albumin, and an increase in the watery constituents of the urine. Edebohls has interfered surgically in two cases of eclampsia.

The writers' case was one which showed the advantage of combined incision of the kidney and decapsulation. The patient was a woman 21 years of age, who toward the eighth month of pregnancy noted a puffing of the face and some headaches. A few days before the expected confinement there were traces of albumin in the urine. As soon as labor began it was noted that the pains were slow and light. A few hours later the patient became taciturn and answered questions incorrectly. She was somewhat somnolent between each of the pains, and the respiration was irregular. This was soon followed by convulsive movements of the limbs, and later a marked attack of eclampsia occurred. An enema of chloral was given. The convulsions became fewer and the patient was semicomatose, a condition which continued all night. The urine obtained by catheter was small in amount and completely coagulated upon heating. The morning of the second day the cervix was mechanically dilated and delivery effected. An hour and a half after delivery there was a violent attack of eclampsia, the coma lasting for twenty-four hours, during which time there were three or four convulsions. The urine was small in amount, dark-brown in color, and contained a large amount of albumin.

After the coma had lasted thirty-six hours an operation was decided on. The patient was given a few whiffs of chloroform. The fatty tissue about the kidneys was thickened and infiltrated, and a large quantity of serous fluid escaped upon incising the fatty capsule of the kidney. The kidney was brown in color, lobulated, and of firm consistency. Its longitudinal diameter was not increased, but its transverse diameter was greater than usual so that the organ was rounded. The capsule was incised over the convex border and was peeled off with ease. There was a slight oozing of blood. The kidney was then replaced. The operation was repeated on the opposite side. This kidney was found cylindrical in form, of a brown-

ish color, firm but less lobulated than the left kidney. After incision of the capsule the borders of the kidney spread widely, with a tendency to form a hernia with the renal substance. After decortication the organ lost its dark color, becoming a brownish-red. An incision extending from pole to pole was carried down to the renal pelvis. This was followed by the escape of a considerable quantity of dark blood, and as the bleeding continued the renal structures began to assume their normal light-red hue. The comatose condition continued during all of the next day, after which the patient obtained some natural sleep; the quantity of urine increased, and convalescence was somewhat tedious though uneventful.

The writers discuss the manner in which decapsulation acts upon the kidney in relieving tension and promoting secretion.

The Surgical Treatment of Puerperal Pyemia.—

TRENDELENBURG, F. *Journal of the American Medical Association,* vol. xlvii, No. 2, p. 81, July 14, 1906.

In the present advanced state of surgical science pyemia is of rare occurrence, except when following aural or uterine infection. The surgical treatment of otitic pyemia by clearing out the thrombosed transverse sinus with or without ligature of the jugular vein is well established, the only differences of opinion being confined to detail. The same plan of surgical procedure might well be followed in puerperal pyemia with like good results. There is a pathologic similarity between the conditions, and a mortality of 50 per cent under non-surgical treatment justifies operative procedures. Puerperal septicemia is one of the most serious and fatal maladies to which women are subject. The as yet limited number of successful cases of ligature of the pelvic veins indicates that we are on the right track, and that the surgical treatment of puerperal pyemia will follow the same route to professional favor as has that of otitic pyemia. The prognosis can only be favorable in acute cases with early operation, as the thrombotic process rapidly extends upward, even to the vena cava, while in the chronic cases its advance may be restricted to the internal iliac and ovarian veins after a lapse of several weeks. Ligation of the internal iliac and ovarian veins at an early period should be performed to prevent the extension upward of the thrombosis. In cases of doubtful diagnosis an exploratory exposure of these veins is justifiable. The danger of such an operation is not to be compared with the greater one that threatens the patient's life from the disease. The transperitoneal method of reaching the vessels is the simpler, but it involves the danger of peritoneal infection. The extraperitoneal operation calls for a larger incision, as the veins are followed to their full extent, and the operation is more difficult and tedious. The danger to the peritoneum is lessened, and the veins can be opened and cleared out. Experience has not shown the invariable necessity of the latter. The exclusion of the thrombus from the circulation by ligation, preventing the contamination of the venous blood, seems sufficient for the purpose. The incision is made the same as for ligation of the iliac artery above Poupart's ligament, and then upward to the tip of the eleventh rib.

The Results of Prostatectomy.—

CABOT, H. *American Journal of Urology,* vol. ii, No. 11, p. 442, August, 1906.

The last eight years have shown marked improvement in the operation for prostatectomy, but much remains to be accomplished. Mere tables of mortality will never express the value of the operation as in appendicitis or hysterectomy. The prostate has both a urinary and a sexual function, and it is practically impossible to remove it without damage to neighboring structures. The aim of this operation is to relieve the patient from the

tyranny of catheter life, and it is misleading to state that all patients who recover from the operation do well. As a matter of fact many patients are made worse. It is by careful study of these unfortunates that the operation will be placed upon a solid foundation. The operation of prostatectomy in its present state requires considerable experience, and each case should be thoroughly studied. The operation itself is but a small part of the treatment of each case. A careful study of the available material shows that in properly selected cases in the hands of competent surgeons about three-fourths of those who survive the operation are cured. Of the remaining fourth many have some relief from the operation. It is reasonable to believe that as the operative treatment becomes more general the results obtained will be better.

Suprapubic Cystotomy Preliminary to a Prostatectomy.—

ELAM, W. T. *Medical Herald,* vol. xxv, No. 7, p. 289, July, 1906.

Drainage by the suprapubic route is advocated for the reason that it is simpler than by the perineal route. The tendency to bladder contraction is not to expel the tube, as in the cases in which it is introduced through the perineum. Should the tube be expelled it can be easily and painlessly replaced, and drainage continues, which is not the case by the perineal route, as the internal sphincter closes, allowing the retention of urine, and necessitating further interference with the bladder, which should be avoided. The suprapubic route admits of irrigation and gives the bladder rest, allowing it to be free of all septic and decomposition products. The claim is not made that the suprapubic route is the best for the major portion of prostatectomies, but it is the best method of managing those cases in which there is an immediate demand for drainage and vesical rest. In a few cases the prostatectomy can be performed by this route, but in others it is better to postpone the operation until a later date.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Nature and Treatment of Backward Displacements of the Uterus.—

STEVENS, T. G. *Clinical Journal,* vol. xxviii, No. 13, p. 198, July 11, 1906.

In a clinical lecture the writer refers to the frequency of this condition. While they do not furnish as much anxiety as some other gynecological diseases, they bulk largely in a general gynecological practice. The indications for interference in pelvic tumors are well defined and can be carried out by one who has surgical skill and a knowledge of technique, but to treat successfully a case of retroversion and flexion requires a careful investigation, accurate interpretation of symptoms, and then a decision as to whether special treatment is required or not. The fitting of a pessary is simple, but it frequently fails to relieve the symptoms. It is most important that the patient's symptoms should be carefully inquired into, for the adjustment of a pessary which does not relieve the symptoms would better not be applied. A large number of backward displacements require no special treatment. The patients have symptoms, but the displacements are not the cause of them.

There are two great classes of backward displacements, the congenital and the acquired. The former have not received the attention which they merit, and to this fact can be attributed much of the ill success in treating them. They are very common cases, and are often discovered when examining patients who complain of symptoms possibly attributable to the pelvic organs. On the other hand there is no doubt that acquired backward displacements form a class larger than congenital

cases, but they occur in married women, and sometimes have much more definite symptoms associated with them. It does not follow, however, that a backward displacement in a married woman requires local treatment, and in an unmarried one does not. The condition may exist in both classes and yet require no treatment. The backward displacements of the uterus in which that organ has been pregnant or has been infected are liable to remain congested for a long time, and as a result there may be endometritis or an overgrowth of the components of the endometrium. It is this congestion or endometritis which really causes the symptoms which are thought to be due to the backward displacement. The converse follows, that a backward displacement of a uterus which has not been pregnant or infected is not usually congested, and therefore does not cause symptoms. The congenital retroverted uterus is not congested because there has never been any cause of congestion in most instances. If a congenital retroverted uterus becomes pregnant or infected it may cause symptoms, and then the case becomes indistinguishable from an acquired one.

The causation of an acquired backward displacement is nearly always parturition or abortion. A uterus in a healthy individual with healthy adnexa cannot practically become displaced except as a result of pregnancy. In a healthy person the uterus cannot be displaced permanently by an accident. Such a cause is often attributed to these cases, but cannot possibly cause a permanent backward displacement. When there is a backward displacement and the history of an accident it is almost certain that the displacement was congenital. It is possible that an unhealthy person living in unhygienic surroundings with insufficient or improper food may as a result of habitual overdistention of the bladder acquire a backward displacement. After labor with a woman in the supine position the uterus may gradually fall back until the fundus gets small enough to descend below the promontory of the sacrum, and then the intestinal pressure getting on its anterior surface keeps it down in the retroverted position. When such a patient gets up it is a mere chance whether the uterus assumes its normal position or remains retroverted. This acts if there is any subinvolution, but it must not be forgotten that retroversion may itself be a cause of subinvolution. The infected but non-pregnant uterus may become retroverted in the same manner, as its ligaments share in the softening effect of inflammation, and being heavy it drops backward and is kept in its abnormal position by intestinal pressure. If there is any pelvic peritonitis, adhesion fixes it in its abnormal position.

It follows that acquired backward displacements are always associated with enlargement of the uterus. If congestion takes place the ovaries and tubes will be involved, frequently being prolapsed into Douglas's pouch, and the folding of the broad ligament which accompanies retroflexion interferes with the normal venous return from the ovaries. The symptoms of retroverted and retroflexed uterus are enlargement, backache, tender ovaries, increased mucous discharge, menorrhagia and dysmenorrhea, a tendency to and sometimes repeated abortions. These symptoms are due to congestion, which is secondary to or accompanies the displacement.

In congenital backward displacement the condition is very different. The uterus is nearly always smaller than usual. The ovaries are rarely prolapsed and not tender to the touch. The vagina in these cases is short, and the posterior wall markedly so, more nearly approaching the anterior in length. Such a uterus gives rise to no symptoms peculiar to itself, except that there is often some anomaly of menstruation, which is usually scanty and

painful—in fact, the disorders associated with a congenitally underdeveloped uterus. Such a uterus is not nearly so often affected with sterility as in the small, acutely anteflexed uterus with spasmodic dysmenorrhea. The small, retroflexed uterus early in pregnancy may be replaced and pregnancy go on normally, otherwise abortion will result. The subjects of these congenitally displaced uteri often suffer from backache, constipation, dyspepsia, scanty and painful menstruation, and dyspnea, the result of anemia. Of these symptoms backache is the most difficult to explain. It is a symptom which occurs with or without displacement and with or without congestion, and it is impossible to say to what extent the displacement may be answerable for it. It may be due to other conditions. Constipation is not caused by backward displacements, and the displaced uterus does not press upon the rectum or its vessels. Congenital backward displacements do not in the majority of cases cause symptoms, and hence they require no local treatment and are best left alone. If a pessary is used in these cases it does not correct the displacement owing to the short posterior vaginal wall. A pessary does not obviate this—in fact, it puts the posterior vaginal wall on the stretch, and hence exerts more traction on the cervix. Experience shows that in this class of cases the fitting of a pessary does not relieve the symptoms, and where it has been fitted the removal of the pessary does not increase them.

Treatment in these cases must be devoted to the dyspepsia, urinary conditions, neuralgias, anemia, and constipation. The acquired backward displacement with symptoms referable to the malposition commonly have two symptoms which stand out prominently—menorrhagia and tender, prolapsed ovaries. These are the symptoms which call for local treatment. If these two symptoms are relieved the others will certainly improve. Pessaries will do little in the cases which are infected, but will probably give some relief in cases in which the congestion is due to the displacement. The sound should never be used for replacement. If the uterus cannot be fixed by the fingers alone, then it should be drawn down with a tenaculum and the fundus pushed forward by a finger in the vagina. This method never fails except where there are adhesions between the uterus and Douglas's pouch. Such a method will not alter a retroflexion, but the uterus can be anteverted as a whole in its retroflexed position. The kind of pessary used is of no great importance, but it should be no larger than necessary to retain the uterus. Where the ovaries are prolapsed and tender a pessary should not be used at once, but the congestion should be relieved by copious hot douches and suppositories of 10-per-cent ichthyol. One drachm of liquid extract of ergot should be given thrice daily and constipation carefully treated. If this treatment fails to relieve menorrhagia and backache the uterus is probably infected and will have to be thoroughly curetted after dilatation, replacement being left until after recovery from this. Where this treatment is of no service, a radical operation must be considered.

Achondroplasia.—

RANKIN, G., and MACKAY, E. C. *British Medical Journal*, No. 2374, p. 1518, June 30, 1906.

For a long time achondroplasia was confounded with rickets. In Liston's Elements of Surgery, published in 1840, there is a drawing illustrating an achondroplasic skeleton. It is described under the term of congenital rickets. The external characteristics of the disease resemble rickets in so many ways that the two conditions may be readily mistaken the one for the other. An achondroplasic infant may suffer from rickets at the usual period for the development of that disorder. The confusion with cretinism is also not surprising, because

the physical features which accompany it are somewhat similar to those met with in achondroplasia, especially in infancy. It is significant that the achondroplasic does not suffer from mental deficiency. The general appearance of an achondroplasic child is characteristic. It is a dwarf with a large head, pug nose, short and often bowed limbs, a prominent abdomen, and marked lordosis. The legs are always so short as to be out of proportion to the size of the trunk of the body, and this stunts the figure in an unsymmetrical way which is quite different from other forms of dwarfism, where the trunk and limbs are shortened in relative degree. The arms are too short, so that the finger-tips never reach to the level of the hips as in the normal individual. The long bones, while short, are usually bent and deformed. In the normal infant the umbilicus marks the central point between the crown of the head and soles of the feet, whereas in the achondroplasic child the central point of the body is above the umbilicus, sometimes as high as the ensiform cartilage, and this relationship continues throughout life.

A significant feature of the achondroplasic is that the dwarfism is only observed on standing. When the child is in the sitting posture its height is not far short of that of an ordinary person of the same age. The abnormal size of the head is confined to the volume of the cranium, which is unduly developed and out of proportion to the face. It may equal or even exceed in its circumferential measurement the length of the body. Prognathism is usually marked, and there is a recession of the base of the nose due to premature ossification of the basilar and sphenoid bones shortening the base of the skull. The lips and eyelids are thickened, and the tongue may be large and protruding, but this is not a constant feature. The hair is abundant and healthy, while the skin is well nourished. The fingers and toes are short and spatulate. The hands are shortened and fat, with fingers of about equal length, which taper to their extremities and at the middle of the phalangeal joints separate from one another, such separation being especially marked between the middle and ring fingers. The shortening of the long bones of the limbs is apparent at birth, but it becomes an increasingly notable feature as the child grows. The natural curves of the shortened bones are exaggerated, and they become abnormally thickened transversely. All the epiphyses are more or less enlarged, and a distinctive rosary is present at the junction of the ribs. In achondroplasia the changes take place in the cartilage bones, while in rickets it is those which are laid down in membrane which are most affected. The contrast between the semimembranous condition of the flat bones of the skull in rickets and their normally grown, firmly developed state in achondroplasia is very striking. The mental faculties remain intact, and education is little if at all less difficult than in normal children.

Of the causes of achondroplasia nothing is known, and comparatively little of its pathology, excepting that it is related to congenital cretinism. It is undoubtedly due to some constitutional anomaly by which the metabolism is altered in an unknown way. Kaufmann distinguishes three types—one in which the cartilaginous portion of the long bones is hypoplastic, and in another it is hyperplastic. A third type is one in which the cartilages are profoundly softened.

The writers describe a boy, the youngest of three children in a healthy family. Birth took place after a normal and unassisted labor, but the child was misshapen at the time it was born. Apart from the deformity he was healthy and vigorous. After reaching the school age he showed a remarkable degree of intelligence, and at the age of nine is a bright, engaging, good-tempered child. The period of infancy was uneventful. The two prominent facts to attract attention were the size

and configuration of the head and a marked asymmetry between the body and the limbs. The head was abnormally large and disproportionate to the size of the face. The dome of the cranium was high and the occipital region unduly prominent. The nose was flattened, and there was deep retraction of its bridge. Prognathism was pronounced. There were some features which would indicate coincident rickets. The mid-point of the body when measured in the erect position was just below the tip of the ensiform cartilage. The following is a table of measurements comparing him with a normal boy:

	This case.	Normal boy of same age.
Height	2 ft. 11 in.	3 ft. 10 in.
Height sitting	2 ft. 1 in.	2 ft. 2⅛ in.
Weight	2 st. 3¾ lb.	3 st. 10 lb.
Circumference of head	20¾ in.	20¾ in.
Tip of mastoid to tip of mastoid	15 in.	14½ in.
Clavicle	4 in.	4¼ in.
Acromion to external condyle	4⅝ in.	8⅛ in.
Radius	3⅝ in.	6 in.
Olecranon to ulnar spine	4¼ in.	6¼ in.
Anterior superior spine to internal malleolus	7¼ in.	22¼ in.
Internal condyle of tibia to malleolus	5⅛ in.	9 in.
Chest, full expiration	20½ in.	24¾ in.

Neglected Incomplete Rupture of the Perineum and its Cure.—

Da Costa, J. C. *Pennsylvania Medical Journal,* vol. ix, No. 10, p. 715, July, 1906.

A neglected rupture of the perineum is one that is unrecognized by the physician at the time of labor or is allowed to go untreated. About 20 per cent of women have the perineum torn in first labors, and 4 per cent in subsequent labors. Almost all cases of long standing have more or less cystocele. This the writer first repairs by making a large oval submucous denudation with the aid of a pair of blunt-pointed scissors, the denuded mucous membrane being then removed by a scissors bent on the flat. Interrupted stitches of chromicized gut or of silk are used to close the wound, the needle being introduced into the mucous membrane about an eighth of an inch from the edge of the denudation and going directly across under the tissues, picking up the raw surfaces and emerging from the mucous membrane on the other side about an eighth of an inch from the edge of the wound. These stitches when tied make a firm, dense

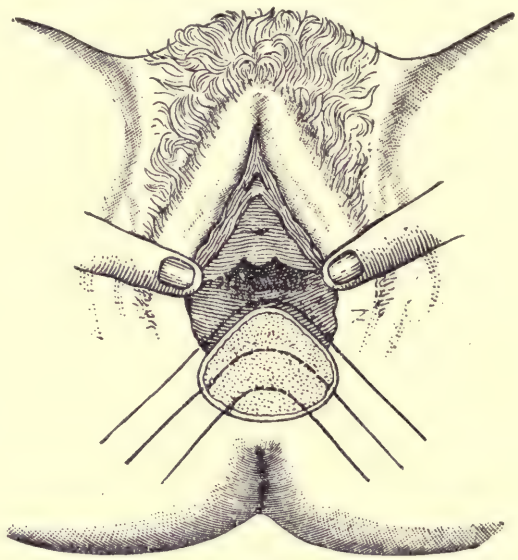

Fig. 1.—Surface denuded and stitches in place.

ridge in the median line which holds firmly. The chromicized gut generally remains for a fortnight and disappears in about eighteen days.

Fig. 2.—Bars, half size.

After this operation the perineum is then operated upon. An incision is made at the junction of the skin and mucous membrane with blunt-pointed scissors. A spherical submucous triangle large enough to include the area of laceration is denuded on the posterior wall of the vagina, care being taken to go high enough to get beyond all scar tissue and to include any rectocele that may exist. The

scissors are not removed until the denudation is finished. The loose flap is then cut off and the wound closed. A long, curved needle is used with a handle and with an eye near the point. It is entered about half an inch from the edge of the cut, plunging directly downward to catch the levator ani muscle, then carried directly across without emerging, picking up the levator ani muscle on the other side, then brought upward through the skin about half an inch from the edge of the wound. It is then threaded with silver wire and drawn back. A second stitch is then put in about

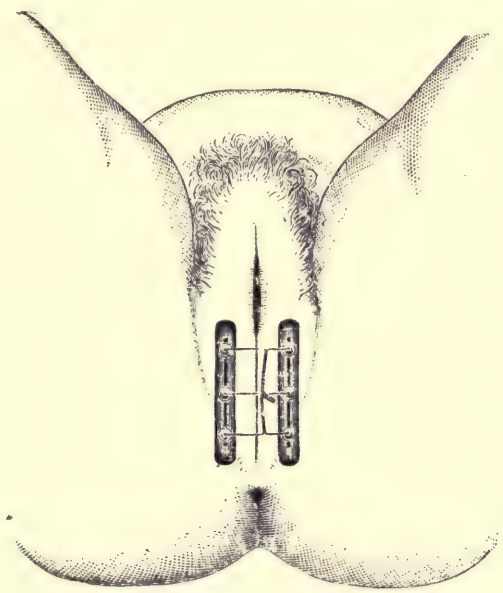

FIG. 3.—Operation finished and bars in place.

the middle of the wound in the same way, and the third or purse-stitch is inserted similarly, but about an eighth of an inch above the raw surface. The ends of the wire stitches are then slipped through slotted rubber bars and clamped with shot, and the ends of the wire twisted over the middle line. This finishes the operation unless a few catgut stitches are inserted. It is important that the upper or purse-stitch should be fastened first, and that all three stitches shall be deeply buried. In twenty-four hours there may be pain and a certain amount of postoperative inflammation; if so the wires are cut above the shot, and this at once relieves the pain and tension. The bowels are moved daily after operation, and the stitches removed in from five to seven days. In eight or ten days the patient goes home well.

In 200 cases the writer has had no failures and no fatalities. He has tried most of the suggested operations in the last twenty-five years, and none of them compare with this one. It can usually be done in ten minutes. Its advantages are the short time which is taken to perform it, the simple instruments required, together with a firm approximation of the deep parts of the wound. It gives a perfect perineal body, and the sulcus so commonly left after other operations is obliterated.

Citrate of Soda in Infant Feeding.—

VAN DERSLICE, J. W. *Medical Standard*, vol. xxix, No. 7, p. 359, July, 1906.

The writer has employed citrate of soda in all cases of artificial feeding that have come under his observation during the past three years. The effect of citrate of soda is to decrease the size and lessen the density of the curds that are formed by cow's milk. That citrate of soda acts in this manner is easily demonstrated by artificial digestion experiments. In adding the citrate of soda to the food of an infant it means less manipulation, and there is added to the milk a substance which is found in human milk. Citrate of soda is not given for its therapeutic effect, but simply for the physical effect of causing the milk to precipitate in fine curds. It is a neutral salt and does not act in the same way as alkalies and soda bicarbonate, which simply inhibit the coagulation of the casein by alkalinizing the stomach contents. In using this method of feeding an effort should be made to develop the digestive tract as rapidly as pos-

sible. At first it is practical to use equal parts of milk and water, though a greater dilution is recommended by some observers. It is seldom necessary to use the citrate of soda after the child is six months old. A good working basis is the addition of one grain of citrate of soda to each ounce of milk, regardless of the dilution or the amount of milk taken at a feeding. The milk used is the ordinary commercial variety, not sterilized, except in cases where its quality is doubtful. If under a diet of equal parts of milk and water the stools contain curds the amount of citrate of soda is increased to two grains to the ounce of milk. This method is continued until the stools are of normal color, homogeneous, and fairly firm but unformed in early infancy. As soon as stools of this character appear the amount is diminished to one grain of the citrate to the ounce of milk. In only a few cases has it been found necessary to give the citrate in larger proportion than one grain to the ounce, and usually the increased amount can be discontinued in a week or ten days. The initial diet of equal parts of milk and water is given for about a week, when the percentage of milk is increased to two parts and one of water. If this does not agree with the infant the higher dilution is again resorted to, but after the stools become normal the proportion of milk is again increased. While the rule is that infants will be able to take whole milk at the end of six months, it has been found in some children that the citrate of soda has been necessary for sixteen months.

A number of cases are reported, all of whom consulted because of disturbances of digestion or other illness. In all cases the cow's milk without other modification and the citrate of soda was relied on. After three years the writer is willing to give it his unqualified support as the most satisfactory and successful method of artificial infant feeding that he has ever employed. Some of the cases were rachitic when they came under observation, but these symptoms soon disappeared. Constipation is a factor in cases fed by this method, as it is in children no matter what nourishment is used. For convenience of prescribing a mixture should be used containing as many grains to the drachm as ounces of milk are given to the child, and giving a mixture large enough for one week's feeding. An infant that is taking milk 4 ounces, water 2 ounces, sodium citrate 4 grains, six feedings a day, is given a prescription for: Sodium citrate, 3 drachms; chloroform water, 10 minims; distilled water, 6 ounces; one teaspoonful to each feeding.

Amenorrhea in Young Women as a Forerunner of General Diseases.—

Coe, H. C. *Medical Review of Reviews*, vol. xii, No. 6, p. 506, June 25, 1906.

There is a certain type of amenorrhea that occurs in women under 25 associated with marked increase in adipose and evident atrophic changes in the uterus. Presumably the ovaries are also atrophic, but there are no other symptoms. The writer sees three or four such cases in the course of a year. These patients are usually in good health, and do not consult because of local pain but from alarm because of the prolonged absence of menstruation, or if married on account of the associated sterility. These cases form the *bête noire* of the gynecologist. The writer has seen only three cases in which menstruation returned after an absence of months or years under the use of thyroid extract. In the others no matter what the treatment employed there was no improvement, though the patients continued to have good health and ceased to be disturbed about their condition. In other cases there was a gradual decline in health.

A typical case of this kind was that of a woman 25 years of age who six months before

being seen had ceased to menstruate. The patient was in excellent general health, had never had any pelvic pain, was rather athletic, and showed a marked increase in adipose. There was an entire absence of the vasomotor disturbances that often accompany premature disappearance of menstruation. Bimanual rectal examination was negative. The usual treatment, such as thyroid and ovarian extracts with the faradic current used several times just before the menstrual period, had no effect. An examination under anesthesia showed that the uterus was smaller than usual, and the case was regarded as one of premature atrophy of the internal genitals. A little over a year afterward the patient died of acromegaly, which developed so gradually that it was not diagnosticated until just before death.

Another case was that of a girl of 18 who had ceased menstruating a year before she came under observation, and in that time she had grown very fleshy. The features were coarse and broad, the lips and nostrils thick, and the mouth enlarged. The patient was mentally sluggish. There was no history of previous pelvic trouble. Examination showed an infantile uterus.

A number of similar cases have come under the writer's notice, but the possible association of the amenorrhea and the atrophy with general disease was not appreciated at the time they were under observation. A careful study should be made of the history of all cases of amenorrhea, as it is frequently the initial symptom of a general disease.

The Tonsil as a Portal of Microbic and Toxic Invasions.—

JACOBI, A. *Archives of Pediatrics*, No. 7, July, 1906.

In the presidential address before the American Pediatric Society, Jacobi said that the relation of the tonsil to systemic invasion presented a problem that was less soluble the more copious the literature. In studying diphtheric invasion of the throat the membrane is confined to the tonsil, the lymph nodes are not involved, but if the disease extends to other parts the lymph bodies swell at once. A laryngeal pseudomembrane also causes no glandular swelling and no fever, which is to be explained also by the scantiness of the lymphatic network. He then takes up the subject of the literature, but finally comes to the conclusion that practically nothing has been demonstrated by injection of the tonsils that was not previously known. Laboratory injections into the normal tonsillar structure made under pressure prove nothing as to the behavior of the unembarrassed organ when *in situ*.

Chorea Considered as Cerebral Rheumatism.—

DUCKWORTH, D. *British Medical Journal*, No. 2373, p. 1454, June 23, 1906.

A careful study for a number of years has convinced the writer that there is more than the commonly accepted intimate association between rheumatism and chorea, but that chorea in fact is a cerebral form of rheumatism. His statistics show that there is a family or personal history of rheumatism in 85 per cent of cases of chorea. He believes that the percentage would have been larger if it had been possible to secure accurate histories of past attacks of the disease.

Pulmonary Tuberculosis in its Relation to Obstetrics.—

WASHBURN, F. H. *American Medicine*, vol. i, No. 3, p. 132, June, 1906.

The following conclusions are offered regarding the relation of pregnancy and pulmonary tuberculosis: (1) Active pulmonary tuberculosis and pregnancy constitute a dangerous complication. (2) Pregnancy exerts an unfavorable influence on pulmonary tuberculosis, both immediately and remotely during

the puerperium. (3) Measures should be taken to prevent pregnancy in women who are subjects of active tuberculosis. (4) As to the principle involved in the question of interrupting pregnancy, there are occasionally indications for such interference in cases of tuberculosis. Artificial sterilization is of doubtful utility. (5) Obstetric tuberculosis is best treated in special institutions, and such places should be provided.

FORENSIC MEDICINE AND TOXICOLOGY.

Nervous Phenomena Following Attempted Suicide by Hanging.—

HART, R. N. *Lancet,* vol. clxx, No. 26 of vol. i, p. 1821, June 30, 1906.

Certain nervous phenomena following hanging have been noted and recorded by many observers. Petrina referred to a case in which unconsciousness persisted for twenty-four hours, during which time there were clonic convulsions, followed by a general condition of muscular rigidity. Terriem refers to a case in which there were epileptiform convulsions followed by opisthotonos, and in which walking movements occurred, and to another in which after being unconscious and convulsed the patient recovered consciousness, but was amnesic. Wagner records a case in which the patient was unconscious for some time, and on his recovering consciousness he rapidly became demented. A difficulty in differentiating these cases is to determine what may possibly be due to the suspension and what to the mental defects which may have led to a suicidal attempt.

The writer describes the case of a man 40 years of age who attempted suicide by hanging. There was no history of alcoholism or insanity, nor on the day of the attempt had he been drinking. For some months he had been depressed and morbid, but so far as could be elicited he had had no definite delusions or hallucinations. A few days before the attempt he had suggested to his wife that they should commit suicide together. He hanged himself with a towel, the suspension lasting about ten minutes before he was discovered and cut down. Some minutes later he was lying on the floor somewhat cyanosed, with respirations 16 to the minute, breathing deeply and regularly. The mark of the towel was on the neck, having passed around above the thyroid cartilage. The pulse was 100, regular, and of normal volume and tension. The pupils were equal and contracted to a pin-point. The temperature was normal, the patient was unconscious, and there was no conjunctival reflex. There had been no escape of feces, urine, or semen. He was put to bed, and for four hours there was no sign of returning consciousness. The pupils dilated slightly, the right more than the left, and both reacted to light. He gradually became quite stiff equally and simultaneously over the whole body, the reflexes being excessive with a marked ankle clonus on both sides. The plantar reflexes were both of the flexor type. The heart, lungs, and urine were found to be normal, the pulse was 104, and the temperature 99.4°. Later in the same day there was conjugate deviation of the eyes to the right, and for periods of half an hour on several occasions there was a rhythmical flexion and extension of the right forearm. During the night there was incontinence of feces and urine. On the following morning he was still unconscious, but not so rigid, the tendon reflexes were not exaggerated, but there was conjugate deviation of the eyes to the right. Forty hours after he was cut down he answered questions stupidly, inaccurately, and slowly. His eyes at that time were normal, and there was control over the excretions. At the end of eight days he was discharged from the hospital, and stated that he remembered nothing of his attempt. After recovering from the immediate effects of

the suspension there were no delusions nor hallucinations, though he was depressed and at times troublesome.

Poisoning by Coal Gas.—

NOER, J. *Wisconsin Medical Journal,* vol. v, No. 2, p. 73, July, 1906.

Attention is called to the difference in the symptoms between mild and severe cases of coal-gas poisoning which is due to a combination of carbon monoxide and carbon dioxide, the former being a deadly poison. The first four of the writer's cases occurred in a single family, and were due to a single poisoning from a stove which had recently been fired, and the damper of which had been closed. One of the patients was stupid and somnolent; two others recovered within twenty-four hours, all that they required being rest in bed and an abundance of fresh air. A fourth case had hematuria lasting three or four days, the headache, nausea, and dizziness persisting for about three weeks, and she remained pale and feeble for a much longer period.

A fifth case occurred in a man who had fallen into a cupola which is used in the smelting of pig iron. He was probably overcome by a nearly pure carbon monoxide gas. The patient was instantly pulled out of the furnace and exposed to the fresh air, so that the exposure to the gas was very brief. When seen shortly afterward he was apparently lifeless. Artificial respiration was started and kept up until breathing was reëstablished. The skin was a reddish purple. The eyes were half open, the pupils dilated and not responsive to light. There was a general muscular relaxation, the conjunctiva insensitive, and mouth partly open. The pulse was at first imperceptible, and was then very feeble and irregular and of low tension. Voluntary respiration was abolished. The treatment consisted of nitroglycerin, strychnine, and digitalin. About ten hours later the patient so far recovered that he was able to walk to his home, a distance of about half a mile. The general insensibility and drowsiness which continued from two to two and one-half hours was followed by a period of excitement with purposeless movements resembling those of delirium tremens. This excited condition lasted four or five hours, and gradually improved as strength returned. During this period the pulse was rapid, the pupils dilated, and the surface of the body covered with perspiration. The temperature, which was at first subnormal, later rose to 101°. The following day he responded to questions and stated that he felt very well, but the mental processes seemed slow and somewhat difficult. The urine contained hematin but no blood cells, a condition which persisted for a number of days.

The Basis of Expert Testimony.—

Journal of the American Medical Association, vol. xlvii, No. 3, p. 232, July 21, 1906.

The Supreme Court of Nebraska holds in Reed *vs.* State that insanity cannot be proved by hearsay or reputation, and it is proper to exclude such evidence. The rule permitting no expert witness to testify as to the sanity or insanity of one whose legal accountability is the sole matter in issue cannot say that at a certain date such party knew the difference between right and wrong, at the time the act was committed. The opinions of non-expert witnesses on the question of the insanity of one charged with a criminal offense are entitled to little or no regard unless supported by good reasons founded on facts which warrant them. From such opinions and facts the jury may draw their conclusions.

The Supreme Court of Kansas in discussing the testimony of a physician (Federal Betterment Co. *vs.* Reeves) given in a personal injury

case brought by the latter says it was claimed that the physician was an expert, who under the rules of evidence might give his opinions based either on facts testified to by others or on hypothetical questions put to him or on an examination of the patient, but he could not testify to conclusions arrived at from the history of the case given him by the patient or others. Such testimony comes within the rule of hearsay evidence, and is not admissible when offered by an expert. A physician cannot give his opinion based partially on what he has been told of the case and partially on what information he obtained by an examination of the patient. A physician may testify to the condition of the patient as he found him, whether suffering from pain, and from utterances or exclamations, and he may also give a statement as to the location of pain causing such exclamations, and he is allowed to do this because it can be said to be a part of his examination.

Homatropine Poisoning.—

BROWN, S. H. *Annals of Ophthalmology,* vol. xv, No. 2, April, 1906.

A description of a case of homatropine poisoning is given, though it is recognized that it may be merely an expression of idiosyncrasy. The patient was highly neurotic, emotional, and suffered from eye-strain. Homatropine hydrobromide was used, two drops of the solution being instilled into each eye at intervals of fifteen minutes. The solution contained 10 grains to the ounce. It had been freshly prepared. The same solution was used upon other patients during the same office hour with no bad effects. Cycloplegia was produced within forty-five minutes after the first instillation, the patient becoming quiet and subdued, conditions diametrically opposed to her natural state. While performing the shadow test the patient became pale, dizzy, and fainted. Morphine was given to counteract the homatropine, but with little effect. The syncope passed off rapidly, and was succeeded by mild delirium and incoherent speech. At the end of three-fourths of an hour the patient was sent to her home, and after she arrived there the speech was incoherent and the actions grotesque. The symptoms persisted for about twenty-four hours. At the end of five days the mydriasis disappeared, and by this time the mental effects had passed off. Some years before the patient had been addicted to the use of morphine, and it was learned that she was unusually susceptible to strychnine and belladonna.

Relation Between Company's Physician and Patient.—

Journal of the American Medical Association, vol. xlvii, No. 2, p. 150, July 14, 1906.

The Supreme Court of Utah says in the personal injury case of Viallet *vs.* Consolidated Railway and Power Company that the plaintiff was hurt in a collision. While in an unconscious condition and under the treatment of another physician he was taken in charge by the physician of the defendant company, who set and bandaged his shoulder, and thereafter made regular visits to his home and waited on him, ostensibly for the purpose of giving him medical treatment, but the principal object was to procure as favorable a settlement for the company as he could induce the plaintiff to make. When the defendant company's physician took charge of the plaintiff the confidential relation of physician and patient was created and continued to exist. This relation requires the physician to act with the utmost good faith, and he is inhibited from taking advantage of the confidence growing out of this relation by exercising undue influence or other unfair means to induce the patient to convey valuable property rights for an inadequate consideration, as was done in this case. Even if it is conceded that the plaintiff notwithstanding the repeated assurance of the physician that his injuries

were slight and that the disability caused thereby would be of short duration still had some doubts as to their absolute correctness, he was not necessarily bound by the release which he signed, provided he was induced to sign it because of such representations. It is not necessary in voiding such a contract to show that the patient had unlimited confidence in the physician, but it is only necessary to show that the representations of the physician did in fact lead him to make the contract.

A Bad Result and a Second Operation in a Malpractice Case.—

Journal of the American Medical Association, vol. xlvii, No. 2, p. 149, July 14, 1906.

In a recent case that reached the Supreme Court of Washington the decision of the lower court finding for the physician defendant was reversed. The trial court had taken the case from the jury, recording a finding for the defendant on the ground that nothing but a bad result had been shown. The Supreme Court in reversing the judgment of the trial court held that there was sufficient shown in the case to have sent it to the jury. The action grew out of an accident which fractured the plaintiff's leg. The accident occurred in the morning, and he was sent to the defendant's hospital, where the leg was set at 4 P.M. A plaster-of-Paris cast was applied, which remained on about four weeks, at the end of which time it was removed. When the cast was taken off the leg, according to the plaintiff, was found to be crooked, so that he walked on the inside of the ball of the foot. About four months afterward he entered another hospital; the bones of the leg were again broken and reset, securing a much better result. At the time of the trial the plaintiff was repeatedly cross-examined, but nothing was brought out in the nature of contributory negligence. The Supreme Court held that proof of a bad result alone was not sufficient to take a case to the jury, but in this particular case the fact that a better result was obtained by subsequently refracturing the bones and resetting them, together with the fact that no contributory negligence was brought out at the time of the trial, constituted a set of facts which proved more than a mere bad result, and it was something upon which the jury should have been allowed to pass.

PUBLIC HEALTH.

Industry and Alcoholism.—

SULLIVAN, W. C. *Journal of Mental Science,* vol. lii, No. 218, p. 505, July, 1906.

The writer in a former communication distinguished two types of drinking, the convivial and the industrial. The former causes drunkenness, but rarely tends to cause chronic intoxication, while the latter, though not an immediate cause of drunkenness, leads to a rapidly fatal chronic poisoning. He points out the fact that drunkenness and chronic alcoholism are largely independent of one another, and that the more serious evils due to alcohol are connected with the chronic intoxication and not with simple drunkenness. Industrial drinking means drinking as an aid to labor, and is explained by the influence which alcohol exerts on nervous and muscular activity. In the large majority of individuals alcohol in moderate doses acts as a psychomotor stimulant, increasing considerably the output of muscular work. This stimulant action lasts only for a short period, and is usually followed by a phase of depressed activity which more than compensates for the initial stimulation. On sensory function the action of alcohol is regularly depressant, causing a diminished acuteness of sensation and a diminished quickness of perception. These peculiarities of alcoholic action determine the primary conditions of industrial drinking. For it to be established the labor must be predominantly

of a coarse, muscular sort, so that the advantage of psychomotor stimulation may be immediately clear to the drinker and may not be discounted by the accompanying disturbance of sensory function. The circumstances of the work must allow of frequent renewals of the stimulant influence so that the reactive depressant energy may be avoided. Where these two conditions are satisfied industrial alcoholism is prevalent. Where either of them is lacking, as will be the case if the work demands skill rather than force, or if involving mainly muscular effort it is pursued under circumstances that forbid free access to liquor, then industrial drinking will be exceptional.

These fundamental influences have developed alcoholic tendencies in each form of industry which lead to more or less distinctive drinking traditions, the vigor of which finds a fairly exact measure in the corresponding occupational death-rate from alcoholic diseases. Two occupations lie at opposite extremes in the scale of alcoholic mortality. Dock labor is the type of crude muscular work demanding a maximum of force with a minimum of skill, and the worker has free access to alcohol. Accordingly the dock worker has an alcoholic mortality second only to that of the liquor trade group. Coal miners work under exactly opposite conditions. It is mostly carried on in eight- or ten-hour shifts, during which access to alcohol is impossible. The only chance for industrial drinking that the miner can have is immediately before he goes down to the mine, and since the effect of a single dose of alcohol is soon lost the mining tradition has it that it is a "muddling" thing to work on. Abstinence from industrial drinking is traditional in coal mining, and this abstinence entails a relative immunity to intoxication and brings the coal miner's death from alcoholic disease to the same level as that of agriculturists, and below that of all the other occupational groups. It keeps the mining districts, despite their enormous addiction, free from alcoholic suicide and from alcoholic crime. While these facts are true of the majority, there are many individual exceptions.

In trades where industrial drinking is the rule there are always a few men who are pure convivial drinkers and never try to work on alcohol. On the other hand, there are skilled crafts where some individuals are able to get a stimulant effect without an appreciable loss of sensory acuteness. On the whole, however, these exceptions are not sufficiently numerous to appreciably affect the general character of the deduction. An obvious deduction from these facts is that in dealing with the drinking problem it is industrial drinking that should be restricted.

Suggestions for the Future of Consumptive Patients of the Working Classes.—

PATERSON, M. S., and SHRUBSALL, F. C. *Lancet*, vol. clxxi, No. 4 of vol. ii, p. 217, July 28, 1906.

The ideal place for a consumptive is a sanitarium, there to remain until his disease is definitely arrested. Such results cannot be secured because of the paucity of institutions, and it often is necessary for him to leave the institution and resume his occupation too soon. It is important that such patients be properly advised. On questioning patients who leave a chest hospital it is found that some are advised to live in the country, others to get light open-air work, others to take a sea voyage, etc. It is obvious that the advice should always be based upon some study of the patient's earning capacity; thus if a man has a trade it may be better for him to return to it than to join the great army of unskilled workers, even though their employment be carried on in the open air. So far as the danger to the community is concerned, if proper care is taken of the sputum it may be

regarded as negligible. The popular view of contagiousness of consumption is unjust and unwarranted and leads to economic error. The most important considerations for the consumptive convalescent are the provision of fresh air at home, good feeding, reasonable hours and conditions for rest—in other words, an ordinary healthy life out of working hours.

Such conditions can only be obtained where wages are comparatively good. No amount of fresh air during work will compensate for lack of nourishing food or bad accommodation during the rest of the day. It should not be forgotten that starvation is a more serious trouble than tuberculosis. The two great risks to the patient whose disease is arrested are overstrain and great fatigue. From this standpoint it is preferable that the skilled workman should return to his former occupation, for what is done with facility can be accomplished with the least expenditure of energy. The hardest and most continuous manual labor usually falls to the lot of the unskilled laborer, such as any artisan would become should he leave his trade. Fresh air throughout the whole day is not so essential once the disease has become quiescent. Less good air will then suffice for a time, provided it is not absolutely deleterious. The problem of the clerk, shop assistant, and warehouseman must be considered in the light of the same reasoning: the relative economic value of his work, his wage-earning capacity in the relation to the cost of living, and his surroundings when off duty. He must earn sufficient to enable him to procure reasonable conditions out of working hours. Drivers and most classes of railway servants cannot do better than remain at their occupations. There is no reason why the unskilled laborer cannot go into the country, but it should be remembered that it is often difficult for him to obtain work. Many patients remain at indoor occupations for years after tuberculosis has developed, and it is reasonable to suppose that had they had the advantages of a hygienic education their lives might have been still further prolonged.

The writer discusses various open-air occupations. Gardening has been suggested, but for the untrained the wages are very low. Emigration has also its serious problems, and going to sea, particularly as a purser's clerk or steward, is perhaps the worst choice that could be made. The conclusion is that so far as possible each individual should return to his own trade, and that those without a trade should be largely governed in the selection of an occupation by their wage-earning capacity. If the only result of the treatment of pulmonary tuberculosis is the production in large numbers of unskilled outdoor laborers, it cannot be looked upon as an economic success.

Fighting Plague in Japan.—

KITASATO, S. *New York Medical Journal,* vol. lxxxiv, No. 1, p. 1, July 7, 1906.

An interesting account is given of the strenuous efforts of the Japanese to free that country from the plague. The disease was introduced into Formosa in 1896, since which time that island has become a permanent seat of dangerous plague. The germ seems to be introduced by cargoes and not by infected individuals. In the last seven years Japan has had three outbreaks of plague, mostly confined to the seaports and the capital. During the past year there have been 297 cases. Attention is called to the expense of fighting this disease. During the first attack Osaka spent 352,500 yen. During the second outbreak Tokyo, although having only 15 victims, spent 220,000 yen. The present epidemic is raging in Kobé and Osaka, and together they have already spent over 700,000 yen, and it is believed that the sum will have to be much increased to keep the plague at bay. The

belief is expressed that the disease is largely spread by rats, though infected patients may be a source, but the latter are easily dealt with.

So far the plague epidemics in Japan have occurred in localities having direct communication with foreign countries, and it has then spread to the interior. The first case in a locality has invariably been associated with freight imported from infected regions, and at the trade ports the rats are first infected. In Osaka infected rats were discovered in February, and during May of the same year the disease appeared in human beings. A winter epidemic is generally of a chronic character and rages for a long period, spreading over a large area. A summer epidemic is usually acute and spreads as a rule by contagion. Quarantine stations have been established to especially guard against this disease, they being equipped with apparatus for destroying rats. Grain and cotton seem to be the chief sources by which the plague germ is introduced, and it is most important that all warehouses should be built rat-proof. Infection of rats seems to precede the outbreak of plague, so that the examination of rats becomes somewhat of a reconnoitering work. In Yokohama infected rats were discovered before any human victim could be found, and the warning was given in time. A thorough disinfection of structures in which infected rats are found is essential, and in some cases it was necessary to burn buildings. In such cases the premises were surrounded by a rat-proof zinc fence so as to insure the destruction of all rats. The zinc walls had a height of about three feet above the earth with a foot or two below the earth, so that the rats could neither climb over nor dig under such a wall. Such zinc walls were built in every epidemic period, but the largest were those constructed in 1903 in Tokyo. The walls enclosed an area of about three-quarters of a square mile, with partitions dividing it into several sections. The total length of the zinc walls measured about four miles. There is no question in the writer's mind but that plague is propagated by rats. Since 1900 nearly five million rats have been killed in Tokyo, but the rate of increase is so great that this enormous destruction has resulted in comparatively little diminution in the number of rats in that city.

In conclusion the writer expresses the belief that plague can be successfully overcome, but he thinks it will have to be fought in India and South China, where it is indigenous, and he believes that it should be made an international effort.

The Bedbug as a Transmitter of Disease.—

GIRAULT, A. A. *Journal of the American Medical Association,* vol. xlvii, No. 2, p. 85, July 14, 1906.

The writer reviews the facts so far as known regarding the agency of the bedbug in conveyance of disease to man. While admitting that nothing has yet been definitely and experimentally proven, he holds that it is evident that the investigation has just begun. This insect is under strong suspicion as regards relapsing fever, leprosy, bubonic plague, anthrax, and tuberculosis, and the possibility of its agency in the spread of other diseases such as diphtheria and syphilis has been prominently suggested. Coplin has found that pure cultures of the typhoid bacillus could be obtained from infected bedbugs, and the writer finds that these insects readily suck the blood of mice, which are suspected of being the carriers of some diseases. Considerations of health and self-defense as well as of decency and personal cleanliness should lead to stringent measures for the eradiction of this parasite.

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EDITORIAL.

THE TORONTO MEETING OF THE BRITISH MEDICAL ASSOCIATION.

A few years since a successful meeting of this association was held in Montreal, and this year the British association repeated its visit to Canada and met in Toronto. As was anticipated, the attendance from England numbered about 500, largely made up of representative English physicians, and most of the British colonies were represented. Seven or eight hundred comprised the attendance from Canada, and about an equal number of invited physicians from the United States.

From a social standpoint the meeting was a pronounced success. It was remarkable with what assiduity the British contingent attended all of the social functions. The section meetings are confined to the morning, the section work commonly lasting from 9.30 until 12.30. In the afternoon there was first some sort of a general gathering, and then a garden party later in the afternoon, after which there was an address and another garden party. These garden parties are evidently a peculiarly English function, and they are carried out with a degree of persistence that would appear to have been worthy of a better cause, considering that the temperature in Toronto during the first three days of the meeting was well up to 90° and the humidity was very high. One especially interesting thing was the thoroughness with which the Englishman applies his idea of what is proper in the matter of dress. During the morning he wears the ordinary sack coat. In the afternoon he appears at the garden parties in a silk hat and a long frock coat, and at the evening garden party two hours later in full evening dress. That this is the correct thing there can be no doubt, but it was carried out under circumstances peculiarly difficult and in a manner showing the stoutness of the British heart. The climax of endurance seemed to be reached at the opening session when the president delivered the annual address. The platform was well filled with university gowns, the most of them made of heavy material, and this in addition to the heavy outer clothing must have created a good deal of suffering, considering that the temperature could not have been far from 100° in the room where the meeting was held, and the ventilation was inadequate. An amusing incident was the receipt of a package containing some pathological specimens which was

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All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

wheeled across the campus by some perspiring workmen, and which exhibited on one of its sides in large letters, "Please protect from frost."

Aside from the discomforts incident to the high temperature and great humidity the meeting from the standpoint of sociability left nothing to be desired. The section meetings were well attended, and all of them presented a good programme. This together with the splendid hospitality of Toronto and the beauty of the city lent an especial charm to the gathering. The meetings were all housed in the University of Toronto, which was quite adequate for the purpose. With its beautiful buildings and splendid campus it formed an ideal setting for a great national gathering.

If one thing more than another is deserving special mention it was the courtesy of the British and Canadians toward their invited guests. In all the section work the Americans were accorded full privilege of discussion, and many papers were presented by those from this side of the line. Taking it all in all it was a felicitous occasion for those who attended the meeting.

One of the most interesting papers and discussion was that which was opened by Professor Chittenden on "Vegetarianism." This has been a perennial topic in the British Medical Association, and brought out some amusing side-lights. Professor Chittenden was at once placed in the position of an avowed vegetarian, though as a matter of fact he took no such stand, merely claiming that his experiments showed that in the average diet there was an excess of proteid which under certain pathological conditions might be harmful. He claimed that individuals could exist in perfect health upon proteid derived from the vegetable kingdom, but that it was wise to do so or that an excess of proteid in the diet might not be useful he did not pretend to say. In a general way vegetarianism was rather roughly handled, several in the discussion practically going so far as to maintain that nutrition could not be supported upon a purely vegetarian diet. These views met with considerable applause, until a representative from India arose and offered himself as a fair example of one who maintained his nutrition on a purely vegetable diet, excluding milk, eggs, and all other products derived from the animal kingdom. He said he was but one of a sect of many thousands who existed in full physical and mental vigor upon a similar diet. Sir James Grant gave a rather humorous turn to the discussion by referring to the fact that while vegetable diet might be practical in India it would not be so useful among the snows of Canada. Either this remark with the thermometer climbing above the 90° mark or the obvious difficulty of associating temperature with proteid metabolism raised a broad smile. The discussion, while illuminating and distinctly of value because Chittenden's work has added considerable to our knowledge of proteid metabolism, has settled nothing except to raise a strong suspicion that the quantity of meat consumed by the average person in good circumstances is far in excess of what is required to maintain the nutrition of the tissues, and that this may be harmful.

PURGATIVES IN TYPHOID FEVER.

In the Section on Medicine at the last meeting of the British Medical Association a paper was read advocating the use of purgatives in all cases of typhoid fever. The author's theory was that the typhoid bacilli were in the intestine and the infection was in a measure gotten rid of by the purgatives. One hundred cases were reported treated under this system, with a mortality of two. In the discussion the general consensus of opinion was that purgatives should not be used in typhoid fever, and the

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argument was advanced that patients who suffered from more or less constipation in the course of the disease commonly did better than those who had frequent stools, hence a quiet bowel was better for the typhoid patient. It did not seem to strike those who took part in the discussion that the latter view was in effect no answer to the former, because it is obvious that a diseased and irritated intestine is almost certain to have an accompanying diarrhea, and that consequently the latter is in some measure an index of the severity of the disease, and hence patients who have severe intestinal disturbance will give a higher mortality rate than those without it.

The whole discussion was based largely on fallacious statistics, and not upon the application of true physiological principles. If these are studied it is obvious what the value and range of purgatives should be in the treatment of typhoid fever. When administered they are not given for the purpose of eliminating the bacilli which are present only to a limited extent in the intestinal tube, but they are given for the purpose of aiding nature in emptying the bowel. It is precisely in those cases in which there are frequent watery stools which are irritating and cause tenesmus and a tendency to tympany that purgatives are of the most value. The diarrhea shows that there is an attempt to eliminate something by the bowel, which should be promptly aided in this effort. Probably the best cathartic for the purpose is castor oil, though the salines and possibly calomel may be of value. Once the intestinal tract is thoroughly cleaned out the bowels should be left alone. The steady routine administration of purgatives as advocated by the proponent in the discussion is certainly objectionable, and as a routine practice is no more to be recommended than those who would entirely reject purgatives in the treatment of this disease.

THE TEACHING OF HYGIENE IN OUR PUBLIC SCHOOLS.

A couple of decades ago the study of physiology was introduced into the primary schools. An examination of the text-books of that period, and, indeed, many of them in use at present, illustrates the absurdity of much of the instruction. An earnest endeavor was made to teach the children how many bones there are in the body and approximately how the circulation is carried on, which was employed as a setting for the leading chapter on the pernicious effects of alcohol and extolling the virtues of pure water. It is impossible to say how much good such teaching has done in reference to alcohol, but undoubtedly it has had an important influence in the obvious lessening of consumption of alcoholic beverages of late years. Gradually a bit of hygiene has crept into this instruction, though the golden rules of personal and domestic cleanliness have not been dwelt upon as fully as they should have been. The Chicago Health Department endeavored to supplement this instruction in 1902. Since this crusade was begun for a higher degree of cleanliness among children there has been a reduction of over 11 per cent in the mortality of the age group in which schoolchildren are included. This cannot be wholly attributable to this crusade, but undoubtedly it has had its influence. Certainly the instructions of the Health Department should be printed in large letters, framed, and hung in every schoolroom in the land. They are:

CHILDREN SHOULD BE TAUGHT—

Not to spit; it is rarely necessary. To spit on a slate, floor, or sidewalk is an abomination.

Not to put the fingers into the mouth.

Not to pick the nose.

Not to wet the finger with saliva in turning the leaves of books.

Not to put pencils into the mouth or moisten them with the lips.

Not to put money into the mouth

Not to put pins into the mouth.

Not to put anything into the mouth except food and drink and the tooth-brush.

Not to swap apple-cores, candy, chewing-gum, "all-day slickers," half-eaten food, whistles or bean-blowers, or anything similar that is habitually put into the mouth.

Teach the children to wash the hands and face often. See that they keep them clean. If a child is coming down with a communicable disease it is reasonable to believe that there is less chance of infecting persons and things if the hands and face are washed clean and not daubed with the secretions of the nose and mouth.

Teach the children to turn the face aside when coughing and sneezing—especially if they are facing another person or when at table.

Children should be taught that their bodies are their own private possessions; that personal cleanliness is a duty; that the mouth is for eating and speaking and should not be used as a pocket, and that the lips should not take the place of fingers.

* * *

Among the reasons for the foregoing are:

The poisons of some of the common and also some of the most loathsome diseases are frequently contained in the mouth. In such cases anything which is moistened by the saliva of the infected person may, if it touches the lips of another, convey disease. The more direct the contact the greater the danger.

It is the purpose of health officials to keep in isolation all persons having communicable diseases during the time that they are infectious. In many cases this is impossible. Little restraint is put on certain mild diseases, as measles, whooping-cough, chicken-pox, and mumps, and even such diseases as diphtheria, scarlet fever, and tuberculosis are frequently so mild as to be unnoticed, and children affected with them mingle freely with others. It is probable that in such cases one of the chief vehicles of contagion is the secretion of the mouth and nose.

It is believed that much can be done to prevent contagion by teaching habits of cleanliness.

But if such instruction is to be effectual it must be continuous. The teacher should notice and correct violations of these rules as habitually as violations of the more formal school rules are corrected.

Even if the question of disease and contagion did not enter into the matter at all the subject ought to be given more attention by teachers. Our schools should not only teach reading, writing, and arithmetic, but it is, perhaps, quite as important that they should inculcate cleanliness, decency, refinement, and manners.

Cleanliness should be taught for its own sake, even if it had no relation whatever to health.

EXAMINATION AND INTERPRETATION OF RADIOGRAPHS.

In these pages attention has been frequently called to errors in interpreting radiographs. In courts of law they have sometimes been spoken of as a new kind of photograph, and the jury has been allowed to inspect them, drawing the same conclusions that they would from an ordinary photograph taken in the usual way. The tricks which radiographs may be made to play while used in this way have been repeatedly exposed. It is certain that they should never be introduced in evidence as "photographs," but it should always be carefully explained that they are only pictures of a shadow. The care that should be exercised in their interpretation is clearly stated in an article in the *Archives of the Roentgen Ray* for September, 1906, by Hall-Edwards. He refers to the importance of examining the plates themselves rather than a print, as no process of reproduction has yet been devised that will bring out distinctly all the details of a good negative. The best way of examining negatives is to have a large sheet of ground glass let into one of the windows, preferably one which has a sky exposure. Next to this an ordinary retouching desk will answer, using a sheet of cardboard or white paper as a reflector. Sometimes when the negative is thin it may be examined at different angles. He emphasizes the necessity of special skill in examining radiographic plates. He says that in x-ray work the shadows of the bones are examined in positions to which we are unaccustomed when handling the bones, hence it is absolutely necessary for a proper interpretation of a radiograph that the individual should have a knowledge of the normal aspect of a part as depicted by the x-rays.

Prior to the introduction of the x-rays there was no means of viewing a joint in the various aspects assumed during normal movement,

hence it is difficult to grasp the situation when these structures are presented in the new aspect. The hip-joint is especially difficult in this respect, unless all of the circumstances under which the radiograph was produced are known. In radiographs of the hip and pelvis distortion and faulty interpretation are extremely frequent. It has been shown that the angle between the neck and the shaft is only correctly brought out when the feet are rotated inward. In Edwards's experience it is better except in very young children to make a separate plate of each hip. After some comment on the present anomalous position of the surgeon *x*-ray expert the writer says that at present he has to compete with the tradesmen, who are to a large extent supported by the medical profession. Surgeons are to be blamed for this state of things, for as long as they accept radiographs from unknown sources so long will the public support irregulars in this work. In closing he refers to Golding-Bird's question: "Can a radiograph show a fracture where none exists?" Which he answers as follows:

1. Epiphyseal lines have been mistaken for fractures.

2. Impacted fracture of the neck of the femur can be imitated by taking a foreshortened view.

3. Fracture through the base of the olecranon is simulated always where the light is directly over the bend of the elbow, the plate being posterior. The band of light is due to the rays penetrating the joint. A lateral radiograph destroys the illusion.

4. The acromio-clavicular joint resembles a fracture. In case of a clavicle being radiographed to show a genuine fracture, this joint was mistaken for a second fracture by a medical attendant.

5. To imitate fracture by sudden break of the bone outline is hardly possible in practice, but the appearance of a gradual thickening of bone can be produced at will. One observer records this thickening to have looked like a Colles fracture, but the other visible signs could not have been present.

AN INVESTMENT COMPANY FOR PHYSICIANS.

We have recently received a circular from a so-called investment company for physicians which illustrates the broad dissemination of the frenzied finance idea. It purports to be a holding company, for it has gathered in no less than six subsidiary companies. One of these is supposed to run a laboratory and sanitarium, another is a drug and chemical company, a third is a publishing company, a fourth is a therapeutic college, a fifth is a purchasing agency, and the sixth is a reporting and collecting agency. We are told that it is the intention to secure 25,000 physicians and 25,000 druggists to subscribe, each taking 100 shares. The amount paid in would be $5,000,000, and we are told that "under ordinary business methods this stock in five years will be worth at least $1000 and should be paying a dividend of from $100 to $250 a year." We are asked if such a nice little sum coming in annually would not be a pleasant addition to one's income, especially when collections are poor. Our answer is most emphatically, yea. This is all to be furnished for the sum of $10 paid down, and the balance, $90, is to come in the form of commissions for referring patients to the laboratory and sanitarium. The subscription for capital stock reads as follows: "I hereby subscribe for 100 shares of the common stock of the Foozelum Investment Company, for which I agree to pay to the order of said company the sum of $100, payable in the following manner, to wit: $10 in cash accompanying this application and the balance of $90 to be paid within

one year from this date, stock to be issued when paid for in full." Then follows a space for a signature.

A sort of codicil is added to this subscription which the applicant is also to sign, and it reads as follows: "To assist the physicians and dentists in paying the above subscription, arrangements have been made with the ——— Laboratory and Sanitarium to pay to the Foozelum Investment Company 10 per cent of the cash business sent by the subscriber to the ——— Laboratory and Sanitarium to be applied in payment on said stock subscription. If at any time the applicant becomes dissatisfied with the investment or has not paid the stock subscription in full within the time limit, then the Foozelum Investment Company may at its discretion cancel the said subscription or any part thereof by paying back to the said applicant the amount of the actual cash paid for the stock. I hereby agree to and accept the above contract."

The above is to be signed by the applicant. At first reading it might seem as if all you had to do under this contract if you were dissatisfied would be to ask for your money back and would get it; for it says that if at any time the applicant becomes dissatisfied with the investment or has not paid the stock in full the Foozelum Company *may at its discretion cancel the said subscription by paying back,* etc. The first is a bona-fide subscription for the stock. The clause by which one is assisted to pay for it is a matter that lies in the discretion of the company. If they happen to like the subscriber and his money it may not be *discreet* for them to return it and permit him to retire. Under such a form of contract one would be liable for the unpaid portion of the subscription, which could be collected at law.

If any of our subscribers are anxious to provide for the future of themselves and their families by entering this magnificent company, we would say that Foozelum is not its true name. But if they desire to coöperate in the enterprise the editor will be glad to furnish them with the name of the company which proposes to take out 90 per cent of the investments in commissions on referred business.

FRUIT AND ITS USES AS FOOD.

C. F. Langworthy in a recent reprint from the Year Book of the Department of Agriculture for 1905 discusses the value of fruit as a food from an economic and nutritional standpoint. He first discusses what are fruits. From a botanical standpoint they are the seed-bearing portion of plants, and the edible fruits of the temperate regions fall into a few groups, such as cherries and plums, apples and pears, grapes, berries, and the various varieties of melons, which are sometimes classed as fruits and again as vegetables. While the color and flavor of fruits are not very important from the standpoint of nutrition, they have an important influence in determining their value. In an extensive table the writer gives the composition of most fruit. Water enters largely into their composition, olives containing the least and watermelon the most, in the latter the figure reaching as high as 92.4 per cent. The protein is relatively low in fruits, rising in the olive to as high as 2.5 per cent and in watermelon to .4 per cent, and singularly enough apples have the same proportion as watermelon. The fuel value per pound is also not high. Olives contain a large percentage of fat, but in other fresh fruits the amount of this constituent is very small, the carbohydrates being their most important constituent from a dietetic standpoint.

In summarizing this part of the subject it is said that fresh fruits are comparable to green vegetables and root crops rather than with the more concentrated foods such as flour or meal; dried fruits being more concentrated compare favorably with bread, dried beans, and similar

foods. The effect of ripening upon fruits is to change certain pectin bodies into sugar. As every housewife knows, unripe fruit is better for jelly making and sometimes for cooking, while ripe fruit is the best for eating uncooked. A failure to recognize this distinction is often responsible for the digestive disturbances which many persons experience in eating raw or unripe fruit. The writer discusses the digestibility of fruits and also the place of fruit in diet, as well as the relative economy of a fruit diet, coming to the conclusion that fruits are wholesome, palatable, and attractive additions to our diet, and may be readily made to furnish a considerable part of the energy required in the daily fare. Fresh fruits are dilute foods and closely resemble green vegetables in total nutrient value, but dried fruits and many preserves are much more concentrated, comparing favorably with some of the cereals and other dry vegetable foods in the amount of energy which they supply. Fruits may wisely be used in a well-balanced diet to supplement foods richer in protein, such as the grains, nuts, eggs, meats, and fish. Intelligently used fruits are a valuable part of a well-balanced diet, and may be eaten in much larger quantities than at present. The importance of handling, storing, and marketing foods under sanitary conditions is emphasized, and it is recommended that all fruits should be carefully washed before serving. Fruits exposed to street dust and other contaminations, particularly those that have a sticky surface, are difficult to clean. Sticky dried fruits are now commonly marketed in closed packages of cardboard, which protect them from dust and insects. This is a practice which should be still further extended. Much of the dust and dirt and other unpleasant features might be avoided if the method of marketing fruit and other fruit products were at all comparable with the standards of sanitation in other lines and what is easily possible.

THE IDENTITY OF DOURINE AND SYPHILIS.

For many years that exceedingly interesting disease dourine of horses, and known as *mal de coit,* has been regarded as identical with syphilis. It has now been pretty definitely settled that dourine is a trypanosome infection, and its close clinical resemblance to syphilis is brought about by the lymphatic invasion and mucous and cutaneous plaques which accompany the evolution of the disease. Like syphilis it is usually transmitted by sexual contact, but it is caused by a specific trypanosome which has the power of penetrating mucous membranes. Additional interest attaches to this disease since the demonstration of Schaudinn of the spirochæta pallida of syphilis, possibly an analogous organism. Recently F. W. Mott (*British Medical Journal,* Aug. 11, 1906) has had an opportunity of examining the central nervous system of a horse affected with this very interesting disease which died twenty-seven months after the primary infection. It is significant that the changes found in the lower portion of the spinal cord of the horse bear a striking resemblance to those of tabes dorsalis. The affected animal was an Arab stallion, and it had 156 characteristic plaques, together with marked symptoms of paraplegia. The disease pursued a very chronic course with many toxic disturbances, including a loss of one of the hoofs. Unfortunately the peripheral nerves were not available for examination, but a severe chronic interstitial inflammation of the posterior spinal ganglia, especially marked in the lumbosacral region, was found. In the lumbosacral region the inflammation was so severe as to cause destructive atrophy of the ganglion cells. The posterior roots in their fiber continuations and the posterior columns had undergone destructive atrophy. Trypanosome infection causes a lymphangitis and an extension by the lymphatics to the spinal cord.

The close resemblance between the nervous manifestations in this case and those found in tabetics, together with Schaudinn's observations, makes a very suggestive combination.

LUMBAR PUNCTURE.

Lumbar puncture as a therapeutic and diagnostic procedure has come to stay. At present there is some retrocession from the enthusiasm which characterized its first introduction, and some contraindications have been formulated, notably those cases of long-continued increase in intracranial pressure such as occurs in cerebral tumor. In such cases where the communication between the cerebral and the spinal fluids is obstructed or obliterated the sudden relief of pressure may result in forcibly driving the medulla into the posterior fossa with a prompt fatal termination. In ordinary infections, hemorrhages and similar conditions, lumbar puncture is devoid of danger providing it is carefully performed. Hackenbruch (*Centralbl. für Chir.,* No. 14, 1906) has carefully formulated the steps in this procedure. Ordinarily puncture has been made between the third and fourth lumbar vertebræ, though it may be one vertebra higher or lower. He points out that it is simpler and easier if a short skin incision is made, and there is less danger of infection from organisms which are commonly present in the skin. The same care should be exercised in making a lumbar puncture that is followed in any ordinary surgical procedure. The skin should be carefully cleansed and shaved over the site of operation, and the skin should be anesthetized by some of the infiltration methods. The opening in the skin need not be more than one-sixth of an inch. There is then introduced into the wound a needle furnished with a mandrel, which is removed after the needle enters the spinal canal, permitting the spinal fluid to flow out. The same precaution should be employed in spinal anesthesia. This latter procedure has deservedly fallen into some disuse since it was first advocated, but it still has its indications.

CESSATION OF THE PULSE DURING THE ONSET OF EPILEPTIC FITS.

A. E. Russell, in a communication to the *Lancet* of July 21, 1906, reports the case of a man who had suffered from epileptic fits all his life. On one occasion while he was in the outpatient department of the hospital the onset of the fit was noted, and the pulse was taken and found to be absent during the tonic stage. A similar observation was reported to the writer by a dentist, who observed the patient in what he regarded as a syncopal attack, but the seizure was followed by tonic convulsions, which established its epileptic character. Moxon also noted the absence of cardiac pulsation during the onset of an epileptic seizure. Aside from a few sparse references in the literature no attention is paid to this symptom, though it is possible that it is far more frequent than is generally supposed. If it should be shown that cessation of the radial pulse is common in the onset of an epileptic seizure, it would be a valuable diagnostic criterion.

ORIGINAL ARTICLES.

SUGGESTIONS IN SPECIAL LINES OF RESEARCH WORK FOR WOMEN.[1]

BY V. A. LATHAM, M.D., D.D.S., F.L.S., F.R.M.S.

To those of you who have been in practice the idea of special work has become a more fixed idea. You have learned something of the weakness in your professional life and are ready to think of some way to improve the same. To those just about to start on a possibly stormy voyage, with its ups and downs, its violent and often uncalled-for criticism by the laity, remember the words: "No man ever sank under the burden of the day; it is when to-morrow's burden is added to the burden of to-day that the weight is more than a man can bear" (MacDonald). Yet here comes our gleam of hope, for did not Henry Vaughan speak these memorable words, "To God, thy Country, and thy Friend be true," and if you follow this surely you will be true to yourself and your patients.

In view of the close relationship our profession of medicine and its ally dentistry bear to the group known as scientific or biological medicine, it seemed to me a review of the possibilities open for us might not be out of place as a subject for thought, and a demonstration of some rather unusual specimens may be of interest to you.[2]

First, with the accession of new territory to any country comes a need for microscopical, chemical, biological, bacteriological, pathological, and botanical students; with them should go some photography, general and photomicrographic, to aid in recording work, as seen during the experimental periods. Added to this the bibliographical knowledge is a valuable adjunct, and women can be especially useful in this field if trained in medicine, nursing, and medical literature. Prepared typists and stenographers who are familiar with scientific terms, papers, and foreign languages, especially that which belongs to the modern science school, German and French, to say nothing of its more ancient relatives Greek and Latin,

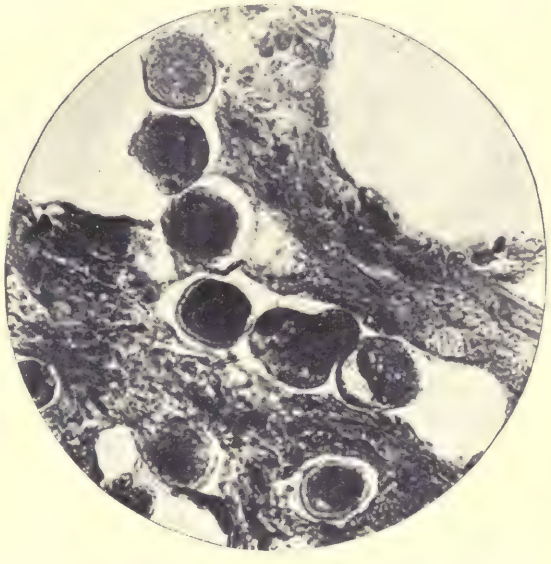

FIG. 1.—Dysenteric ulcer of the intestine, showing amebæ coli. Photomicrograph by V. A. Latham (x 500).

for here we find our bearings when we take up the zoölogical and botanical studies as well as our general medicine and pathological terminations and synopses, will find an especial field of usefulness (Figs. 2, 3, 12, 14, 21).

The science of biology stands to-day as almost *the* important subject accessory to medicine. Why it is relegated to such a secondary position and placed along with a comparatively simple or dead branch, physics, is a wonder to

[1]Address given before the Alumnæ Association, Woman's Medical College of Pennsylvania, May 25, 1906.

[2]Illustrated with lantern and microscopical slides, photomicrographs.

every would-be research student. Our slight knowledge is not what it should be—indeed, it's a standing disgrace. A longer and better course should be provided in all our elementary schools, especially those preparatory and acces-

FIG. 2.—Mosquito, female. Culex pipiens.

sory to the medical schools—the training in handling small and large objects; the training of avoiding errors, fear, and repulsion. The close relationship of the vital processes to anatomy, chemistry, physiology, botany, zoölogy, and technique makes it indispensable in grading a student's knowledge and in giving the fundamental subjects for their lifework in medicine, to say nothing of the pleasure in every-day outdoor life.

Those who feel that medicine is not suited to them have a choice of many lines of work, any one of which will give name, fame, study, and keen pleasure, and yet is a vital necessity to our profession. If you know German you can increase your knowledge of newer discoveries, proved and unproved, for our work is most often in a foreign language, and it is a regrettable fact that some men go so far as to say: "It must be published in German or French to come before the world for acceptance." The journals likely to be consulted are German and French, for biological work there is further advanced and stands prominently before the world, a good deal like our "American inventions." The economic side of biology offers a profitable and required field of work—the fauna of our Great Lakes; the prevention of crop diseases due to parasites, both animal and vegetable; the value to agriculture of the chemistry and bacteriology of the soil; the botanical study in the rotation of crops; the veterinary sciences; the dairy supply and methods; the chemistry and adulteration of food; medicolegal work, as the microscopic study of forgeries in documents; study of poisons; recognition of stains in murder cases; the analytical and assaying work in metallurgy; the economical and social status as applied to diseases of working people, especially those engaged in the chemical arts, as phosphorus, arsenic, aniline dyes, bleaching works, brass foundries and lead works, etc.

The physiological study of foods, the effects on man, the bacteriology and chemistry of preserving foods for the masses in times of peace

FIG. 3.—Parasite in blood of Chelydra Serpentina. Stained by Wright's solution. Showing halteridium which causes the corpuscle nucleus to break up by amytotic division—all stages to be seen in the various cells (x 1000).

and war, is no slight undertaking and offers a most useful study for women, both as housekeepers and for scientifically trained women, who are all the more reliable by their breadth of knowledge. For we must note the condi-

tion, strength, and food-producing properties; safety in eating—the appearance of the fruit and vegetables for cultured and epicurean taste; the flavor, which must be nearly like the fresh article; the keeping properties, to allow of its being carried in the tropics and arctic regions, to withstand the miscellaneous and terrific methods of loading and unloading, now in a steam car, now in a wagon; again, a steamship with close packing and bad ventilation of the hold; again on a burro as a part of an army train; into the barracks for the men whose health must be kept up to a fighting and sustaining point. Does not the victory and welfare of your country demand it, as well as the effort to lessen the bulk of food, which must be maintained in as small a compass as possible?

To the question of a very important field, namely, tropical medicine, your Quaker City has again taken a lead in having a society for the study of these problems, and do we not need it? What with immigration from all parts of the world, with acquisition of new lands, must we not defend our homes from pestilence, from parasites, and to secure and keep the best of fauna in those deep, fathomless waters, not only from an economic but a social, biologic, and medical point of view? Again, have we need of all the microscopy we can learn? Note its pleasures in revealing new worlds, new ideas and hobbies, new theories, adding missing links to the chain of evidence in supplying new vital points in some life-saving discovery. Histology is acknowledged a hard study by the freshman. Why? Because it presupposes a biological knowledge together with its allies, physiology and chemistry, and hence is not easy to follow in its minute and intricate findings when every teacher requires his or her own specialty to be just so important. Take all you can of it, for you will need it later in your study of disease and its sister, general medicine. The aid in assisting you to have manual dexterity in surgery, be it general or special, in ophthalmology, nasal, aural, and throat work, or dermatology, must be an incentive to learn it thoroughly. It is the framework for the practice of medicine, and that is what most women prefer compared to the poorer chance and hardly-fought battle for surgery when your brother physicians and the public are against women being so strong-minded as to attempt that specialty! Granted, it is more fascinating, and it

FIG. 4. — Mosquito, male. Culex. Photomicrograph by V. A. Latham.

gives a much larger fee. Success in many instances is more certain, for the field of view is there, but it is no higher credit than a long and carefully treated case of endocarditis, typhoid fever, that troublesome asthma, and bronchitis and colic in babes, for these are your bread and butter makers as well as to make you a well-trained and successful family practitioner.

Let me also draw your attention to the number of missionary workers that the practice of medicine sends out to the foreign field. Are you doing your best to fit them for this branch,

letting them know little or nothing of medicine, for only a few have the chance of interneships, a year or two of practice before they enter on an entirely different world, unprepared to guard their own health, because tropical

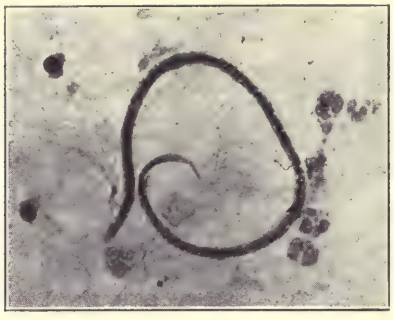

FIG. 5.—Filaria Nocturna (Manson) in the blood; Filaria Sanguinis Hominis (Lewis); Filaria Bancrofti (Bancroft). Stained by carbol-fuchsin, showing the internal structure and the V spots near the head and tail.

hygiene is new and little has been done in the way of recorded experience? Medical hospital reports are few and far between and often meager. When a worker lands in the new station, eager and vigorous, he often forgets the difference of climate, dress, peculiarities in diet, turning night into day, for the humidity and heat should be avoided; inconveniences in traveling, sleeping and drinking in any and all kinds of places. An attack of dysentery is usually a greeting to the newcomer, and the origin never thought of in the excitement of the new wonders (Fig. 1). It is hard to get another doctor, and the tired patient finds out only too soon the knowledge of materia medica is wanting. The therapeutics of ipecacuanha are recalled, but the physiological dose to cure that dysentery is almost enough to make one fear that it is toxic instead of curative, and then the lack of elegant pharmaceutical preparations is most keenly felt! Scarcely well, alas! comes another foe, which is so insignificant as to be forgotten by those of a fair amount of epidermis. In a short time, a feeling of nostalagia, is it? A cold? No; a chill, fever, and a conscious head tells one the story. A visit from Mrs. Anopheles with her blood-sucking propensities and her 80 odd species! Too late we think of a little hygiene stowed in a corner. Preventive medicine must be taught, and women should take up this branch. Municipal work as inspectors and medical officers of health is good for them, and they are well equipped for such house-cleaning (Figs. 2 and 4).

With the remembrance of our materia medica we learn quinine is a prophylactic as well as a destroyer of the plasmodium malariæ (not correct zoölogically, but in general usage—Laveran, 1880) (Fig. 9). What is that? Well, it is our biology coming again, and we learn we deal with the protozoa group, which includes four great classes: the sarcodina or ameboid forms, and in which we get many parasites, as amœba coli (Fig. 1), balantidium coli; trichomonas vaginalis; the sporozoa or spore-producing forms (the malarial organism); and perhaps some day our carcinomata etiology may be traced in Plimmer's bodies or in the cell structure as suggested by Moore,

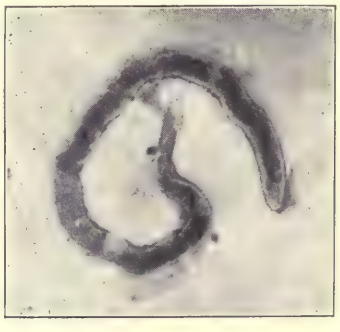

FIG. 6.—Filaria S. Hominis vel Nocturna (x 850), showing filarial ecdysis. The V spot, central spot, and tail spot and granular cells well seen.

Farmer, and Beard. The birds in the tropics have malaria with its chills and fevers, and it is wise to be able to take a bird's temperature under the wing and study the missing links, as the flagellated body in halteridium and pro-

teosoma, for here we find the endocorpuscular parasites, and it opens up a large field for study and comparison in morphology and life history of the malaria parasite in its relation to man (Figs. 3 and 9). But, how comes that

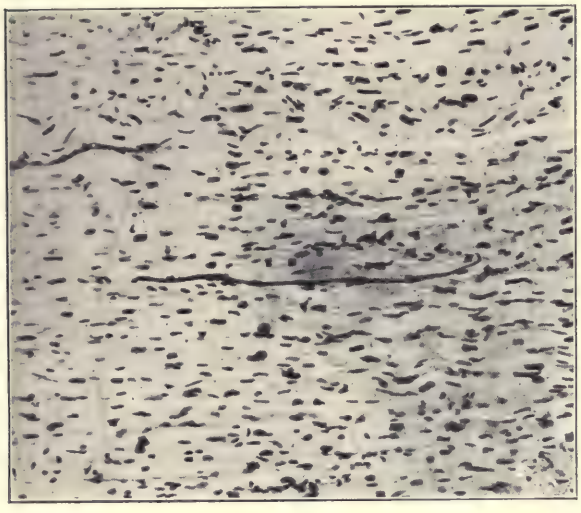

FIG. 7.—Filaria S. Hominis in heart muscle of man. The worms are very numerous, but only two shown. Stained by hematoxylin.

lively little body inside that red cell with its amebic action? Usually Mrs. Anopheles Mosquito brings it in her bill and plants it; hence always dress in colors they do not like, and be screened in from such loving kisses, which may turn out to be your greatest enemy (Fig. 2). Luckily she is nothing but the aunt or cousin of Mrs. Stegomyia or she might bring destruction, pestilence, and sorrow if she gave you a little organism called a bacterium of yellow fever. Again we call on preventive medicine, but no head or government bureau responds except army or navy hospitals or through the local officials of the health department of various States, and these are not always harmonious and long for a chance to beat each other's industry. Another relative of this obnoxious little insect is the Culex mosquito, and even she has brought some disagreeable game in her beak—filaria, so thought (Figs. 2, 4, 5, 8). Is this all? Well, no; Mrs. Mosquito acts as a host for dengue fever (Graham), in malaria for about ten days before the anophelines become infective, filaria and perhaps yellow fever for twelve days. To Laveran, Grassi, Sir Patrick Manson, and Ross must we be ever grateful for their discoveries in making that death-dealing coast of West Africa a home for a living man and not his grave, to say nothing of the economic value in India, Cuba, Luzon, Panama, South America, etc. The value of biology is again seen, and the most marvelous and wonderful part of the discovery it seems to me was when Major R. Ross filled out the missing link and traced the connection between the zygotes or parasites in the mosquito's stomach and the small spindle-shaped bodies, sporo-

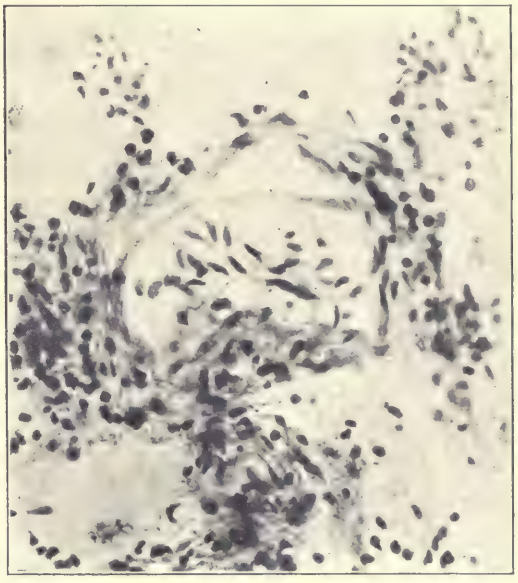

FIG. 8.—Filaria Sanguinis Hominis (Lewis) or Filaria Nocturna (Manson) and Filaria Bancrofti (Bancroft) in a section of lung of man.

zoites, which break away from the zygotes and find their way into the salivary glands of the mosquito.

At one point in the study of malaria[1] the

[1]Malaria has been found in flea's blood by Dr. S. McGibbon, at Topia, Durango, Mexico, at an altitude of 5900 feet above the sea level. *J. A. M. Assoc.*, p. 218, July, 1906.

progress is extremely slow. Although we know some 80 anophelines, in only about 8 to 10 do we know with certainty that they convey malaria—*i.e.*, have sporozoites in their salivary glands. Remember, even a mosquito is not to

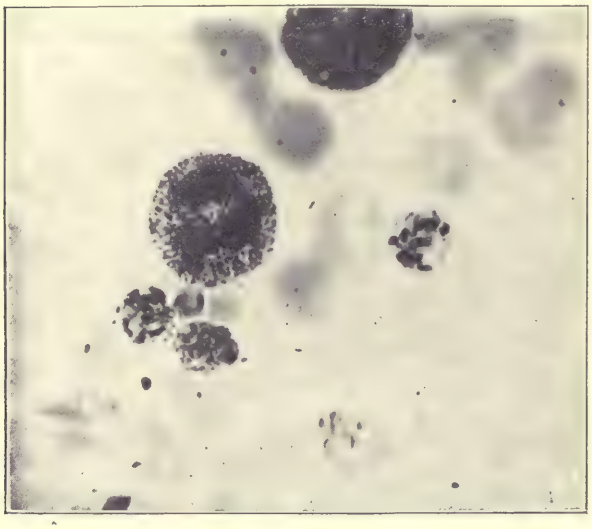

FIG. 9.—Malarial blood, showing Schüffner's dots, polynuclear leucocytes and granules.

be despised. She may bite, she may eat, she may hatch, but dissect her out patiently, carefully, and remember that in small beginnings are great endings. It is to Major Ross's perseverance and patient work in cultures, in dissecting day and night, amidst ridicule, envy, and change of station, that he carried out Manson's theory, only to add a greater work in watching the organisms grow, and such work must be admired and respected when we add the dangers and difficulties of a tropical climate to the work. Many years will elapse before medical men, let alone the laity, realize it or the benefit to be obtained. So many items need yet to be investigated, such as the question of eosinophiles acting as phagocytes in malaria. For Indian malaria offers special deviations in the behavior of the cells. Phagocytes never seem to attack immature crescents nor male crescents before the flagellæ are thrown out, but then they surround them, and it is a good study to examine phagocytes in malaria, where they show up well (A. Buchanan). A statement has been made that flagellation only appears in extravasated blood, and not until some little time has elapsed, but Major Buchanan has shown there is a certain time after the fever when a maximum number of gametes flagellate. Schüffner's dots (Fig. 9) are said by some to be diagnostic of the benign tertian form, though Dr. A. Powell, of Bombay, says he saw them in malignant tertian! They are not known yet as to their character, but the change in the corpuscle after a benign tertian parasite has entered is curious. Blood-plates need more study, and I am glad to see Dr. Mary Rowley, of Boston, is noting their histologic character and conditions in anemia and in malarial anemia, where they are especially numerous. Malignant tertian fever is remarkable as a type disease, for I believe we

FIG. 10.—Showing splenic, abdominal, and in some cases inguinal gland enlargement of the native children as seen in the Congo Free State.

have no other febrile disease in which part of the fever is caused by asexual parasites and another part by sexual.

Another valuable discovery and needing more research is the subject of enlarged spleens

—malarial, leukemic, and kala-azar—where Cunningham-Leishman-Donovan bodies have been found and their development under certain conditions into a flagellate form (trypanosome), as seen and described by Major

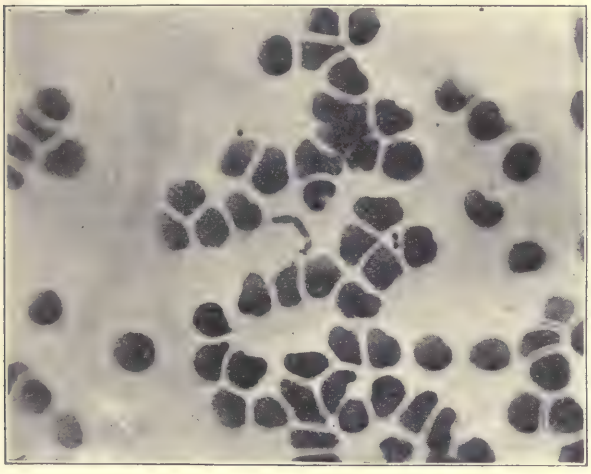

FIG. 11.—Trypanosome in the blood (Lewisii), x 1200.

L. Rogers, I.M.S. (Figs. 10 and 11); the tracing out of the life history of the trypanosome in its relation perhaps to kala-azar, and as an etiological factor in sleeping or Congo sickness with its many fatalities; the difficulties of culture now overcome by Novy and McNeal, and the further stages in development, as noted by Schaudinn, of the halteridium in an owl's blood, which when taken into the stomach of a mosquito, *Culex pipiens* (Figs. 2, 3, and 4), is transformed into a trypanosome, and which if again inoculated by a bite of a mosquito into an owl repeats the life history. This renders it one of the most widely spread parasites in its many appearances in different parts of the globe, and shows the need for a more precise study of biology than many physicians possess. Schaudinn found a leucocytozoön of the owl which also develops in *Culex pipiens* and gives three types of flagellate organism, as in development of halteridium (see Figs. 3, 12). These stages are very minute, and are probably a spirochæta, or rather treponema, like the S. pallida of syphilis. This germ has been classed under bacteria, although it has not been cultivated by ordinary means; the best known species being spirochæta obermeieri, of relapsing fever in man, and is thought to be carried by bedbugs[1] (Fig. 13). This disease is to be dreaded by the colonist almost as much as that of malaria, though it is usually only contracted if living with the natives.

The limits of these genera need most careful determination in order to decide which of the forms fall under the bacteria, unicellular, and which are flagellate protozoa—*i.e.*, unicellular animals.

Parasites of connective tissue, such as the guinea-worm, are important; so far we only know the female worm with certainty, and that averages 30 to 40 inches.[2] I believe Dr. Primrose, of Toronto, Canada, reported a case

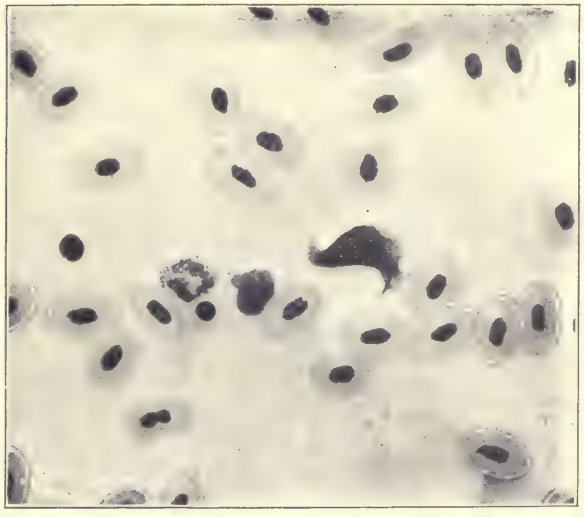

FIG. 12.—Trypanosome infection in frog's blood, with hemosporidium in some of the cells.

[1]Dr. W. J. Goodhue (of Molokai Leper Settlement) has succeeded in demonstrating the bac. of leprosy in the mosquito (*Culex pungens*) and the bedbug (*Cimex lectularius*), and thinks the latter is more of a factor in the spread of leprosy among the natives than the gnat.—*British Medical Journal*, Aug. 4, 1906.

[2]The male has been discovered by Dr. R. H. Clarks at an autopsy in Lahore. *Scientific Memoirs Medical Officers of the Army, VII, Calcutta.*

on this continent. There is some idea that cyclops quadricornis may act as the intermediary host (Fedoschenko, in Turkestan), and that in drinking the water it is acquired; also the danger of many other varieties, as by bathing in Africa—bilharzia (Figs. 16 and 17).

To any one who practices medicine, whether in the tropics or the more temperate zones, a knowledge of entomology is of great value (Figs. 4, 6, 14, 21).

Few diseases, be it of man, animal, or crops,

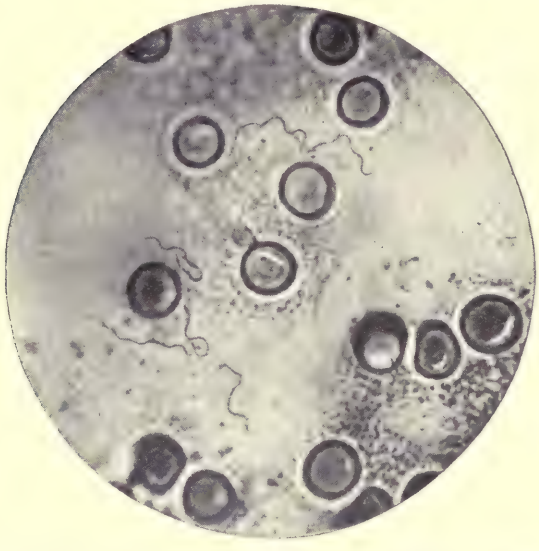

FIG. 13.—Spirillum of relapsing fever (Obermeieri) in human blood from India. Stained by carbol-fuchsin. Photomicrograph by V. A. Latham (x 1000).

but what bear a close relationship to each other. Take, for example, the etiology of human trypanosomiasis as conveyed from the sick to the healthy by means of a particular tsetse fly (*Glossina palpalis*), which seems to have some association with the wild pigs in the Congo Free State (Figs. 14 and 15); for the distribution of this fly and sleeping sickness in Uganda is identical! (Fig. 11). Some evidence has been obtained which shows that other species of the fly can also transmit the disease. A question as to the part that certain water insects which prey on the larvæ may play in the eradication of some of the anophelinæ is worth considering, and some gain may occur from the discovery in the United States of a new sporozoön parasite of the Anophelina by Johnson (*Journal of Medical Research,* vol. vii, 1902, No. 2, p. 213), and a larval roundworm, *Agamomermis culicis* (Stiles, *Lancet,* Jan. 8, 1903), which is said to render the female mosquito barren and induce disease in the insect. Even mosquitoes have a parasitic tick attached to them. When alive it resembles a tiny preserved cherry, and is attached to the under surface of the thorax and abdomen, but it was also seen once on a wing of an Anopheles (A. Balfour, Latham). A thoroughly good larvicide, non-volatile, harmless to vegetation, non-poisonous, simple in application, easily soluble, readily diffusible, not obnoxious to the eyes or nose, and at the same time cheap, is what is wanted. Possibly the nearest known chemical agent is a proprietary preparation (chrysoidine, 1:30,000), made from aniline dyes, and used successfully in rice-fields, but its color is too pronounced, and it is too expensive for practical purposes (Fig. 18). The planting and cultivating of the sunflower along the malarial stretches of the Mississippi valley has proved useful in the swamp regions as a preventive, and it is of great value as an economic product, the oil, seeds, and fiber all being useful. For Culicifuges an application of equal parts of citronella oil and absolute alcohol is pleasant and useful in the Sudan. Another line of study is that of the insects and vegetable parasites injurious to crops. The protection of the aphides by ants is familiar to many, and the danger of harboring the aphis in melon culture, dura, or sorghum has been noted in Egypt and other countries. The Acacia or Sant tree is also attacked by a scale insect. The question of the utility of the ladybird beetles (Coccinellidæ), which along with their larvæ feed greedily on the aphides,

is an important one, and women could study these to advantage at home and abroad. From what little has been said it shows the need of greater attention on the part of physicians to the microscopical part of their studies, together

FIG. 14.—Tsetse fly, Glossina palpalis, male (x 6). Carrier of the trypanosome of sleeping sickness. Compare the mouth parts with G. pallicera (Fig. 15).

with a broader knowledge of biology. Let it be remembered that a practical, simple, and compact outfit can be secured which will give a physician the greatest help in diagnosis at home, and more especially abroad. In tropical countries few diseases occur that do not require systematic work with the microscope. A matter for regret is that in this country we have no journal which takes in the practical side of such study and the newer technique and simpler methods of work. Diseases of animals are most important to colonists, as in tsetse fly disease, coast fever, cattle plague, tick fever, floor-maggot, etc.

The vague symptoms and ill-defined conditions of debility and anemia so common abroad are in many cases due to animal parasites, as uncinariasis or hookworm, malaria, etc., and no case of diarrhea should be treated without a microscopic examination of the stools (Figs. 19 and 20). How important this work is for many children's diseases could possibly be more easily understood by a careful examination of the food remains. Before any medical-missionary worker goes abroad thorough study in clinical microscopy—hematology and biology, entomology and zoölogy—adapted to such work should be insisted on by the Board of Foreign Missions to equip their candidates to prevent sickness in others, as well as to more surely reach the true cause of disease. From them much good work in examination and classification of mosquitoes by the simpler methods, as advocated by Captain G. Liston's method of palpi markings or Giles's method, would render great service. It is a loss to this country that such work is not encouraged and given in the medical reports of the work of the medical officers in foreign places, especially practical points in preparing specimens, studying and showing varieties of disease met with in those localities. The general statement,

FIG. 15.—Tsetse fly, Glossina pallicera; liable to be confused with the G. palpalis (x 6). Compare mouth parts with Fig. 14.

when asked why more such work is not done, is the complaint of lack of time and shortness of help, as well as poor outfits and a lack of requisite training. Some works are now appearing that will be of service, but some au-

thors forget that few of their readers are trained in zoölogy and biology far enough to follow all their remarks. To the student it is superfluous to point out the desirability of personal, practical verification of at least some of the data already obtained, such, for instance, as might readily be done by studying the halteridium in the blood of the crow, there witnessing the various phases of the parasites' behavior, including the curious and remarkable phenomenon of fertilization.

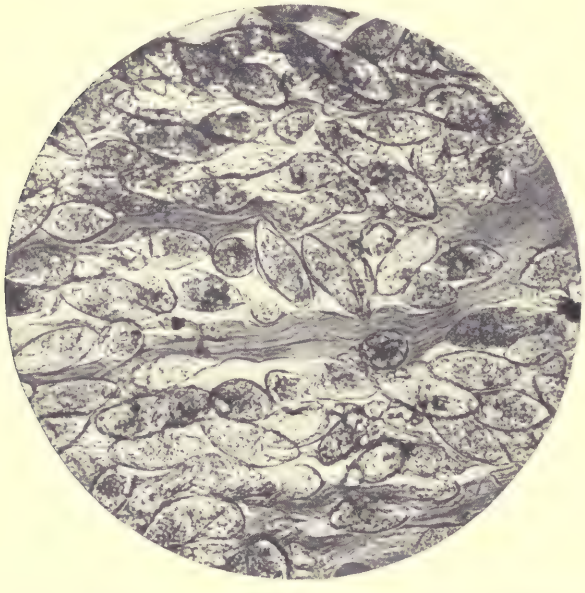

FIG. 16.—Section of human liver showing the ova of Bilharzia hæmatobia (Distomum hæmatobium); x 110.

The subject of spirillosis or "tick" fever as caused by spirilla seen in Uganda, and noted by Drs. P. Ross and Milne (which may again be related to the trypanosome, Schaudinn), is of interest, for relapsing fever is next in order to malaria as the danger to colonists. So is "Texas fever" (*Pyrosoma bigeminum*) of Smith and Kilbourne; "Rocky Mountain" or "spotted fever" (*Pyrosoma hominis*) of Wilson and Chowning; the relapsing fever of India (*Spirillum Obermeieri*), found in 1873; and the spirochæta pallida and other forms occurring in syphilitic lesions. All these are open to investigation, for nothing is known of relapsing fever outside of the body of the infected animal, nor of its stages within the host (Fig. 13). In "Texas fever" observations as to the phases presented by the parasite in the new host are entirely lacking; still there is no disposition to dispute the correctness of Prof. Theobald Smith's findings. Materia medica offers a field for work; for example, the question of finding some agent to take the place of quinine in pregnancy cases complicated with malaria is important, for three-grain doses in the morning, and then followed by a similar dose in the evening, have been found to cause very troublesome contractions of the uterus, and only with tincture of opium were they stopped! In quartan malaria fine results are often obtained. Quinine, 10-20 grains, on the first, second, and third day stops the paroxysms for a time, but it is necessary to repeat the doses at intervals of a week. Malignant tertian if severe is especially difficult to deal with.

There is probably no medicine so useful as calomel and quinine when properly used, but none which are so much abused when given at random in cases in which *no malaria* is present, where it does more harm than good, for it may have a certain poisonous effect. In planning an outfit there is no difficulty. The stains and photographic agents can now be secured in *soloid* form,[1] and they take little room, keep well, and are ready to make a definite solution, with directions for use, and they are inexpensive. Baker, of London, has a neat traveling stain case in metal which can be carried safely as regards the contents. A pocket case is also made for collecting specimens of blood, which can later be examined by an assistant and a blood-count made. Dr. Edward Horder has a complete hemometer case designed to contain all the apparatus required for blood examina-

[1] Soloids—Burroughs and Wellcome.

B. J. C

tion, and at less than one-half the usual price, and very compact (measuring 6⅞ x 4 3/16 x 1½ inches), in metal case, if desired. The same author has a very handy metal clinical case for blood film and sputum work, etc., and

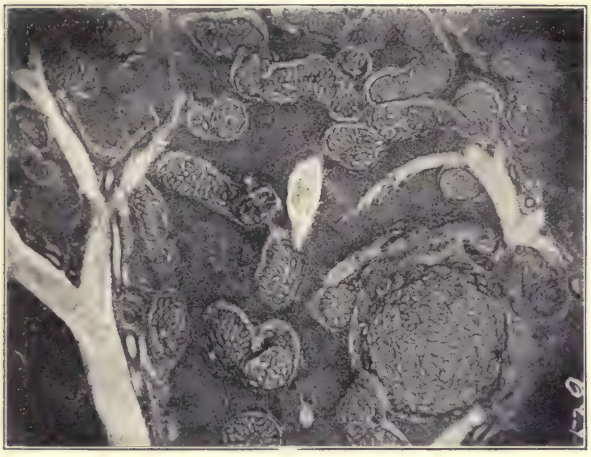

FIG. 17.—Trichocephalus Dispar in the liver of man. Masses of ova seen all through the tissue and blockading the blood-vessels and bile-ducts.

a neat little metal storage box which holds 50 slides in 78 mm. x 45 mm. x 34 mm., or 3 1/16 x 1¾ x 1 5/16 inches. With the new compact diagnostic folding microscopes as designed by Ross and others, there is little need at the present time to complain of the difficulty in technique and amount of outfit necessary to examine our patients more critically for their benefit and ours.

People who expect to become foreign residents are now looking up the matter of personal hygiene. Some suggestions that have been proved by experience and through the writings of travelers may not be out of place. *Clothes:* For outdoors, white, gray, or yellow in color, in the order named, if the wearer expects to encounter the direct rays of the sun. For example, the Arab uses white cloth so the light rays are fully transmitted, and they are not dangerous to the nervous system of white men; but as is well known, this transmitted light has been blamed for much skin disease in blondes, and is especially dangerous to light-haired, blue-eyed people to live out-of-doors where it is always bright and sunny, and no greater mistake could be made when they have consumption, for then they have not too much strength, and the glaring light falling upon the skin and eyes, unprovided with dark pigmentation to absorb it, is a source of irritation and fidgets, which makes recovery rather difficult. A cloudy climate is better for blondes, and there is nothing dangerous or unsuitable in a moderately damp climate, so long as the patient is well cared for, comfortable, and contented. The *underclothing* should be opaque, and black is best, though yellow will do. This combination is seen in certain animals which have white hair and black skin. It reflects most of the heat and light, allows few actinic rays to

FIG. 18.—Drinking well for travelers in the forest in the Congo Free State. A good breeding place for mosquitoes, cyclops, etc.

penetrate, and experience proves the combination to be very comfortable. A black negro dresses in white, and is as comfortable and happy a mortal as we wish to see in the Philippines. *For evenings:* Black is best to radiate

the body heat, as in the case of black nocturnal tropical animals, and is actually cooler than white garments of equal weight.

For office workers and those not exposed to the direct sun's rays, and who do not need white, experience shows black or dark blue is cooler. Our Manila police found blue more comfortable than white or yellow (khaki) when they could seek the shade. In the sun of course blue is too warm. Always avoid the direct rays of the sun between 8 A.M. and 4 P.M., and remember to use opaque clothes for day use in the tropics, as Von Schmaedel and others advised. *Hats:* Must be thick and opaque enough to exclude all short violet rays, and have a wide brim, for even a few minutes'

FIG. 19. — Ankylostoma or Agchylostoma duodenale (hookworm). In photographing for the internal structure the head and tail details were lost on account of the difference of the plane of the object.

exposure to the sun in India may be fatal. Here note how nature has protected the Hindu and the negro with a profusion of black hair to prevent the rays going through, and their almost immunity to sunstroke, etc. American women have lately been adopting a custom of wearing heavy wraps, but no hats or umbrellas, in both winter and summer on the streets. It is a habit that is ethically wrong, is a dangerous custom, and possibly may be a factor for some of their neurasthenia, and it is wrong to let children go bareheaded in the sun with so little clothing on. Consider the extreme in fashion from the projecting bonnet of, may I say, the Quaker style, to the almost impossible fashion of to-day. Certainly it gives our aural and nasal specialists more work, and I fancy may be the cause of increase in otitis media and mastoid cases. The body well clothed and the head bare must cause an unequal circulation, and on entering warm rooms after a cold and even freezing or high temperature must of necessity cause a sudden hyperemia in the mucous membrane, and so aid as a nidus for germ culture or inflammation. Many cases of malaise, neuralgia, and neurasthenia of the head of blonde women have been noted to be caused by the glare of the shell windows in the Philippines, and it is no wonder occupants of the light houses go home in greater numbers than the Dutch or British, who live in better regulated and darker ones. White houses should not be permitted in cities, for many bad eye diseases are given your neighbors; greens, dark yellows, and browns are the most useful for the glare of the tropics. Remember our ancestors knew a little about hygiene in their own way and kept the rooms cooled by water basins with violets or other plants, and excluded all the summer heat of the daylight till the twilight hours came on, and had breezes blowing in the low rooms. Was she not more healthy than the modern woman who hurries in the light and heat instead of using early evening and early morning hours for such enjoyment or errands? To-day we are building and fast filling our sanatoriums at a rate that would horrify our ancestors!

Natives in Malay and Spain always take a siesta and close the offices and houses from noon till 3 P.M., and exclude light, no matter how hot it is. Five years in India is about equal to two in the Philippines. Easy-going English people, Dutch, and Germans stand it well, but not the Americans, who rush around to the limit for two years, and return home wrecks. The value of climatic conditions can be well seen by remembering the naval station of Cavité—hot, situated on a low, sandy point, no shade trees or green anywhere. The men on service after twelve months had to send home eight naval officers, all disabled by neu-

rasthenia contracted at this station. The rules prescribe a tour of duty there as two years, but the extreme limit of safety is twelve months or less. Hence no governing body should make such rules unless experience has demonstrated

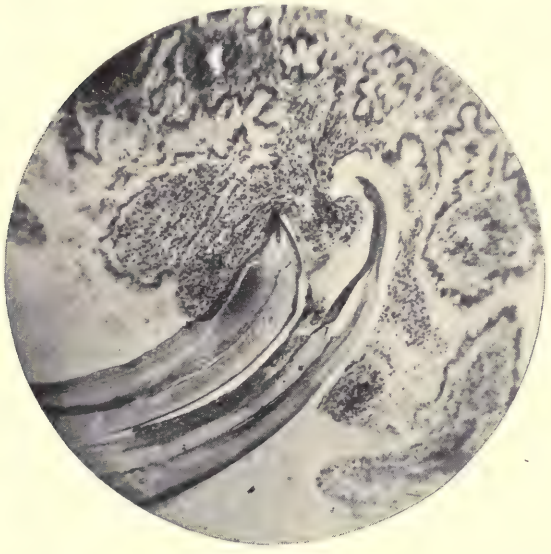

FIG. 20. — Uncinariasis or hookworm, section 0.01 mm. thick. L. S. through a young Agchylostoma caninum, reared artificially in a dog and preserved *in situ*. The worm has grasped the base of a villus, the tissue of which it is devouring and extending down through the whole length of the esophagus. Section by Dr. A. Looss; photomicrograph by Dr. H. Bitter (x 110).

the safety of the men. A short tour saves them being invalided and an expense to the country, and more efficiency of the men.

Seattle is cloudy or hazy, has an excellent health record, and is an especially good place for recruiting invalids from the tropics, and it is an ideal location for hospitals for convalescence.

Baths must be tepid or warm, not cold as at home, for they stimulate a nervous system which is already overstimulated.

While the sun of the tropics is so dangerous to some people, it is at the same time the great salvation of those regions, the chief sanitary agent, destroying microbes and all disease-breeding refuse. It has been reported there that an exposure to the sun's rays of any article infected with smallpox germs can be purified entirely within fifteen to twenty minutes. Even the insect world around Mombasa during the hot season is helpless under these scorching rays. A box of lump sugar invaded by small red ants was laid out on a sheet of paper in the sun. In twenty minutes there was not an ant left except some little blackened corpses of those which had lingered too long. They could not stand the fierce heat. The natives, though, do not seem to suffer so much because of their anatomic and physical structure and environment and their care in the number of hours of work.

Hours to retire should be well regarded, the afternoon siesta adopted, and *alcoholic drinks avoided*. The extremes of heat and cold, night air watched for, and dress accordingly, as well as the screening of house, beds, and people to avoid obnoxious insects. The use of leggings

FIG. 21.—Eggs of Gastrophilas attached to horse's hair (bot-fly). The larvæ are swallowed and attach themselves to the mucosa of the stomach. The egg case open and the larva coming out, and its attachment near the hair. (Slide by Miss M. A. Booth.)

is also valuable against the bites of chigoes, harvest bugs, ticks, fleas, and snakes, and it is well to avoid sleeping on mud or wood floors of huts, through which the blood-maggot may

burrow into your feet in the night. There is need for first aid and training in the prompt treatment of snake and noxious insect bites; and carrying the little pocket lancet with permanganate of potassium is wise for snake countries.

In maladies for which no known causes have been found it is probable that the etiology belongs to the unstudied protozoa rather than that the bacteriologist has been unsuccessful. If animal organisms are factors in the production of disease we must work out new techniques and new lines of research in the lower forms of life, and again follow the adage that from small beginnings are great endings. Remember the words of the Talmud: "The day is short and the work is great. It is not incumbent upon Thee to complete the work, but thou must not therefore cease from it."

CHICAGO, ILL.

THE TREATMENT OF IRITIS AND SEROUS IRITIS BY ACETOZONE.

BY CHARLES WRAY, F.R.C.S.,

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During the last sixteen months I have treated all my cases of intraocular inflammation on the assumption that they were the result of bacterial action, and with gratifying results. The usual practice is to use the recognized local methods and base the constitutional treatment on such history as is obtainable from the patient. The *post hoc, ergo propter hoc* fallacy is the rule, and the possibility that there may be no connection, or only an accidental one, between a constitutional disease and an intraocular inflammation is lost sight of. Were the urethral discharge in gonorrhea invisible, what would be our view of the etiology of gonorrheal iritis in a syphilitic subject? Are we to ignore the possibility of organisms that have no connection with venereal disease causing iritis in persons who are the victims of syphilis?

The relation of cause and effect in gonorrheal iritis is obvious and beyond question, but how are we to explain why it causes iritis, etc.? Do the gonococci gain admission to the blood, or is the disease caused by the presence of toxins in the circulation? It is probable but not certain that the inflammation is due to circulating toxins, because the effect of the cocci on epithelial structures seems to be to cause a violent purulent inflammation, whereas gonorrheal iritis is distinctly non-purulent, although the iris is to all intents and purposes an epithelial structure. It is, however, necessary to explain why the toxins inflame the iris rather than the ciliary body and the choroid. Doubtless this is due to the position of the iris diaphragm suspended in the aqueous and laved on both surfaces by toxin-laden fluid, whilst the ciliary body is exposed to it on one surface only. The ciliary circulation is rapid, but the secretion of aqueous and its removal from the anterior chamber slow, hence there is time for the toxins to diffuse into the aqueous. These considerations illustrate the necessity of securing an *ad maximum* dilatation of the pupil at the first visit. Epithelial structures constitute our greatest protection against all forms of septic absorption, and once this epithelium is removed both bacteria and toxins have easy access into the tissues and circulation. When the pupil is dilated the epithelium of the iris is crowded and compact and doubtless tends to prevent access of the toxins to its interstitial structure, and this most likely constitutes the explanation why recovery is usually prompt and relief from pain pronounced, as soon as

full dilatation is obtained, whilst imperfect dilatation, as from the presence of synechiæ, is usually attended by slow convalescence and a tendency to relapse. Doubtless the reasoning that applies to gonorrheal iritis applies also to syphilis and tuberculosis, although bacilli undoubtedly exist in the tissues in the latter disease. As regards diabetic iritis, the disease may or may not be accompanied by organisms and toxins. It is possible the sugar may be sufficient to excite the inflammation, but all the same we must not lose sight of the clinical fact that the tissues of diabetics are peculiarly susceptible to the action of microörganisms. A most unsatisfactory feature of constitutional treatment is the slowness of its action, and the effect of delay in the action of remedies is only too evident in the treatment of diphtheria by serum. When it is used on the fourth day it may be said to have scarcely any action, and the disease will run its natural course. In the treatment of syphilitic iritis we cannot get the patient under the influence of mercury in less than four or five days. If in this disease early treatment is equally imperative, then we must infer the toxins will have done their worst and the exhibition of specific remedies will have but little effect.

Obviously in the treatment of intraocular inflammations we must use remedies that we can rely upon to act in a few hours. Fortunately these are at our disposal. If the toxins are in the aqueous they are obviously on their way into the general circulation. Being almost certainly albumoses (Sydney Martin) the blood has to be hurried as frequently as possible to the liver in order that the albumoses may be converted into urea, and to the kidneys that the urea may be excreted. Egg-albumin and albumoses injected into the circulation are excreted in the urine, but this form of direct elimination is less likely to take place where small quantities only have to be got rid of. Did it occur to any extent albumoses would be found in the urine, which is apparently rarely if ever the case, in diphtheria, tetanus, and typhoid.

As we can increase this form of metabolism by compelling the patient to drink water copiously, all my patients have been instructed to take exercise and copious potations of water on the lines more explicitly set out in the next section of my communication.

I have made it a rule for several years to inquire into the condition of the bowels in all cases of ulceration of the cornea and eye inflammations, and find, especially in children, they are mostly foul, often very foul, and the association is so frequent it can scarcely be a fortuitous one; hence I used to begin the treatment of such cases by the internal administration of resorcin, salol, etc. Resorcin has the advantage of being very cheap, and is tasteless and relatively non-toxic, but in several cases it produced quite unexpectedly quasi-carboluria, and in the circumstances I felt some hesitation in continuing its use. Salol is about as efficient as resorcin, but it is apt to make the patient feel very ill. I then found that acetozone was used with considerable success and safety in typhoid, and inferred as it can be used in such asthenic conditions with advantage it might be useful as an intestinal and general antiseptic in eye diseases. At first I gave it in three-grain doses, five times a day, in four ounces of water. Subsequently I increased the amount of water materially, and my present method is as follows: The patient drinks a tumbler of water and takes his capsule immediately, after which he walks briskly for ten minutes, and then takes a second glass of water, and again walks for ten to fifteen minutes. The first dose is taken before breakfast, the next in the middle of the morning, middle of the afternoon, and in the evening.

Several German authorities lay great stress on the method of the administration of Carlsbad salts, and urge that they should be given with much larger quantities of water, "so that

the salt finds its way over a larger surface of the intestinal mucous membrane." It is quite certain we obtain better results by using large quantities of water with acetozone, but it is less clear that this is because it finds its way over a greater length of intestine, as it is just as likely that the water stimulates metabolism. Doubtless it acts in both ways, by reaching the lower part of the intestine and also by increasing metabolism.

The results have been so satisfactory that we shall never revert to the old methods. It is probable that the best results have not been obtained, but convinced of the value of the treatment it can be supplemented by the use of recognized drugs, such as the inunction of mercury, etc.

Altogether I have used the acetozone-hydrotherapeutic treatment in 45 cases of iritis, serous iritis, and interstitial keratitis, also in one case of syphilitic optic neuritis and two cases of sympathetic ophthalmia.

If the cases of iritis are seen early, before the fourth day, not infrequently the patient experiences relief from pain in a few hours, and we frequently find all redness gone by the sixth or seventh day. When it persists longer it is generally because the pupil is badly dilated. We should of course as a routine procedure dilate it as much as possible at the first visit, and use dionin only when satisfied as to its safety and of our inability to relieve pain by other means. Then, too, the drug should not be ordered for home use unless under intelligent supervision, as in some instances it causes myosis, even when there is complete atropine mydriasis. In a case recently under my care for iridocyclitis, despite the full dilatation from the use of atropine the instillation of a few drops of dionin was followed by a pronounced contraction of the pupil, so that it became the same size of that in the unatropinized eye. Thinking the drug might be at fault it was used for several other cases, but without causing contraction. Under the influence of cocaine and one-per-cent atropine ointment, the pupil dilated appreciably in an hour, but the probability is had the patient been instructed to use the dionin several times a day extensive adhesions would have been formed before her next visit and irreparable damage done. On looking up the subject it appears Dr. Suker and several members of the Chicago Ophthalmological Society have seen similar cases, so that the condition is not as uncommon as one might suppose.

As regards subconjunctival injection in these diseases my experience has not been conclusive. My impression is it is best to confine one's local applications to atropine, and sedulously avoid all those of an irritant character. The only case in which I used any other drug locally was in one of interstitial keratatis, in which lot. hyd. cyanid. 1:10,000 was ordered. The result was a serious relapse which the mother attributed entirely to its use. Whether this was the true cause or not is difficult to say, but it seems unwise to use irritants for an inflamed organ. My own rule in applying germicidal lotions to the eye is to bathe for three minutes at a time, the applications to be made by means of a piece of cotton-wool the size of a walnut, which is to be well saturated and left on the eye for that period—a little of the lotion to go inside all the time, but not sufficient to pain the eyes or irritate them. By this means we are less likely to do harm, the lotion is absorbed better, and the applications are less painful.

The following cases treated by acetozone are of interest:

A case of sympathetic iritis with keratitis punctata that had been under treatment off and on for twelve months in the ophthalmic department of a large metropolitan hospital. At the patient's first visit to the Croydon General Hospital on December 16 vision was 6/18; December 20, 6/9. Three weeks later vision was nor-

mal, and the eye appeared to have made a perfect recovery. He was seen about ten days ago, and the eye remains free from all traces of deposit.

A second case of sympathetic iritis. This patient came to the Western Ophthalmic Hospital on November 17, with vision reduced to counting fingers (Dr. Hewkley). On November 24 vision was 6/24; December 1, 6/9; December 22, 6/9, and slight K. P. January 19, no trace of deposits even under high magnification. This patient was seen three weeks ago, and the eye seems to be free from all trace of disease, with the exception of a little uveal pigment on the lens.

The extreme seriousness of these cases was explained to the patients, and the satisfactory character of the results is largely due to their intelligent coöperation.

In all nine cases of interstitial keratitis were treated by acetozone. Several of these were severe. In one case not only was the cornea opaque and salmon-colored, but it bulged in an alarming way. In the course of six weeks the corneæ had cleared sufficiently for the patient to get about, and the vision is now 6/60 to 6/36. In a second case one eye was lost before the child came under my care, and the sight in the other was reduced to seeing hand movements at a few inches. This, however, was relieved in less than a week, although all previous remedies used in an ophthalmic hospital had proved unavailing. The child is still under treatment, but as the disease had lasted for many months and the corneæ were leucomatous before the child came under my care it is improbable there will be any considerable improvement in vision. In a third case that has been under treatment for over six months, but with excellent results as regards vision (6/6) the patient was unable to carry out his instructions properly on account of his work. In addition a good deal of harm was probably done by eserine, used to combat an attack of tension, which was +1 for several days. One case with large salmon patches recovered in three months, with vision 6/9, and another in eight weeks, with vision 6/9. The remainder are still under treatment.

The acetozone treatment has also been used in a case of syphilitic neuroretinitis, that progressed rapidly in spite of pil. hyd. c. creta ii t.i.d. The disease was promptly arrested, the disks normal, and vision 6/6 in six weeks.

The results in all forms of iritis were admirable, and equally so in interstitial keratitis, when seen within a week or so of the commencement of the disease. Indeed, in the latter two or three days at times suffice to remove the corneal opacity, and nothing remains but a little keratitis punctata. In future cases there is no reason why the treatment should not be combined with inunction, but in nearly all the cases treated by acetozone, mercury had been tried for at least six weeks and in some cases for several months. The only objection to acetozone is the price, and this is a consideration if the drug has to be used for several weeks. Doubtless in iritis this would be inconsiderable and the money wisely spent, but in cases of chronic interstitial keratitis the price would be almost prohibitive. Three-grain doses seem enough in iritis, but it is not unlikely larger doses could be given with advantage. Messrs. Parke, Davis & Co. do not advise the use of the drug by means of capsules, but this method has advantages. However administered there is no doubt it should be given in eye cases with a much larger quantity of water than in typhoid.

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ENURESIS.

BY WM. F. STUCKY, A.B., M.D.,

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One of the most difficult problems to the average practitioner is the treatment of enuresis, or bed-wetting.

As so many factors enter into the etiology of this disease, let us first review some of the most frequent causes. Those cases due to organic disease of the brain or cord will not be considered, as from the very nature of the trouble any treatment pursued will be almost useless.

From the standpoint of convenience, I consider the following classification of causes the best:[1] (1) Those in the central nervous system; (2) in the urine; (3) in the bladder; (4) in adjacent organs.

1. Anemia and malnutrition produce a general atonic condition, with which may be associated a loss of tone of the vesical sphincter. An inherited nervous constitution, or a condition of extreme nervousness or neurasthenia, may also produce an increased irritability of the vesical nerves. In such cases we usually find associated with the incontinence chorea, epilepsy, hysteria, neuralgia, or other nervous symptoms.

2. Changes in the urine itself are very frequent causes of enuresis. Highly acid urine, associated with lithuria, is very often encountered. An increased amount of phosphates is also frequent. I have found this in about 75 per cent of urine examined, in some instances the amount being so great as to give the urine a markedly milky appearance.

3. Vesical lesions as causative factors are very infrequent. Cystitis and calculus are the ones that are most common. A congenitally small bladder is also sometimes found.

4. The causes in the adjacent organs are adherent prepuce, balanitis, phimosis, a narrow meatus; rectal irritation from pinworms, fissure, and rectal polypus. Vulvovaginitis and adherent clitoris are rare causes.

The symptoms of enuresis are few, the only subjective symptom, as a rule, being very frequent micturition. This may be noticed only at night, or it may be both nocturnal and diurnal.

For the treatment of this condition many remedies have been recommended. Nearly every drug in the materia medica has been used, and enjoyed popularity for a while. Belladonna, however, seems to have been the favorite for years. It is best given as the alkaloid atropine, 1/1000 grain for each year of the child's age. In the diurnal form, and where the disease has run a long course, it will have to be given every three or four hours during the entire day; but where the symptoms are manifested principally at night, the drug will have to be given only in the afternoon and evening. Thus, a dose could be given at 4 P.M., 7 P.M., and 10 P.M.

In those cases due to an atonic condition of the bladder, strychnine has proven very satisfactory. Ergot will also sometimes give relief in these cases.

Chloral, the bromides, and a long list of sedatives have been recommended. None of these, however, seem to possess any particular virtue.

The treatment that has given the best results in my hands has been boric acid and salol. Three to five grains of each, according to the age of the child, is given every three or four hours. The sedative and antiseptic effects of this combination bring speedy and very pleas-

[1]Diseases of Infancy and Childhood—Holt.

ing results. In some cases of long standing slight benefit has been noticed after even a week's treatment by this method. The length of time required to effect a cure is undoubtedly much shorter than by any other remedies I have ever tried.

Fifty patients treated by this method in the children's clinic at the Hospital College of Medicine and in private practice, of whom I have been able to keep a perfect record, have all been permanently cured. Six of these had an atonic condition of the bladder sphincter, and small doses of strychnine were added to the above prescription.

In those cases in which bacteriuria is a symptom I have tried urotropin. Under this treatment the urine speedily clears, but the course of the disease is not so quickly arrested. The peculiarly sedative effect of the salol upon the central nervous system seems to be lacking.

Local measures, electricity, massage of the bladder through the rectum, and epidural injections have never appealed to me. The nervous condition of most of these little patients is a serious contraindication to the employment of local treatment.

Of course any local condition, phimosis, pinworms, etc., must be corrected in order to complete a cure. Even in these cases, however, I employ the boric acid and salol as an adjuvant, and find the course of treatment much shorter than without them.

NARGOL IN ACUTE GONORRHEAL PROSTATITIS WITH INVOLVEMENT OF THE VESICAL NECK—AGED 63.

BY C. L. WHEELER, M.D., LEXINGTON, KY.

There has recently come under my observation a case of acute gonorrheal prostatitis with involvement of the vesical neck in a man aged 63. The patient, a carriage builder by occupation, contracted gonorrhea, and consulted a physician, who gave him some kind of an injection to be used with a hand syringe. Two weeks later the posterior urethra became involved, and there was swelling with retention of urine. At this time the patient's sufferings were extreme; the catheter was used, relieving the retention, but carrying the infection into the prostate and vesical neck. Two days later the patient was taken to the hospital. At that time there was profuse discharge from the meatus. Microscopical examination showed abundant gonococci, both free and enclosed within the pus corpuscles. A microscopical examination of the urine showed red blood cells and pus corpuscles abundant, a moderate quantity of mucous threads, and a few connective tissue shreds. Epithelia were found from the urethra, prostate and prostatic ducts, the neck of the bladder, and from both the upper and middle layers of the bladder. At this time there was complete retention of the urine, the patient was suffering severely, there was rigor, and a temperature of 102° F. The enlargement of the prostate was so great that it occluded the rectum, and defecation was accompanied by intense pain. The prognosis at this time appeared to be grave.

Treatment was begun by irrigating the urethra with a Janet-Frank syringe with a Wheeler rubber tip and shield. Sterile water was used. A No. 10 coude catheter was passed into the bladder and the urine withdrawn. The bladder was then irrigated with sterile water until the fluid came away clear, after which two ounces of one-per-cent nargol

was thrown into the bladder and allowed to remain. The catheter was withdrawn as far as the prostate, and one-half ounce of a two-per-cent nargol solution was injected and held in place for ten minutes. Six hours after this treatment the temperature was still 102°, there was a chill, and the pulse was 110. The following two days the temperature remained at the same point, and on the fourth day there was a continuous dribbling of the urine, when the strength of the nargol solution employed was increased, that which was injected into the bladder having a strength of two per cent, and that used in the urethra four per cent. On this day the temperature fell to 100.8° and the pulse to 100. On the following day, the fifth since beginning the nargol treatment, the temperature fell to 99.2° and the pulse to 96. For the following ten days the temperature was normal, and at the end of this period there was a slight attempt to control the bladder, though there was considerable dribbling at intervals, voiding an ounce of urine at each effort. On the thirteenth day the nargol solution was reduced in strength to one per cent in the bladder and two per cent in the urethra. The following day an attempt to examine the prostate by the rectum caused intense pain. On the next day an attempt at intravesical irrigation with a Janet-Frank syringe and Wheeler rubber tip and shield proved too painful. By the twentieth day there was fairly good control of the bladder, but some dribbling at times. On the following day intravesical irrigation was somewhat painful, but the catheter was abandoned. During the following week the patient improved quite rapidly, and it was possible to examine the prostate, which was found to be very sensitive and swollen. At this time there was slight pain on defecation, but the patient was able to sit up, and on the following day left the hospital.

The subsequent treatment covered a period of about two months, during which the patient was seen at the office. At this time through the Valentine irrigator there was used one-half pint of a 0.5-per-cent solution of nargol for the intravesical irrigation, and four ounces of a one-per-cent solution for the anterior urethra. In the early part of the ambulatory treatment the bladder capacity was six ounces. At this time a cold psychrophore, Valentine's prostatic model, was used for fifteen minutes, at 45° F. Two weeks after beginning this treatment no epithelia from the prostate or middle layer of the bladder could be found in the urine, but there were still some epithelia and shreds from the urethra. No gonococci were found. An examination of the prostate showed that it was slightly enlarged, firm, and not sensitive, somewhat smaller than the average prostate in a man of 63. The bladder capacity was eight ounces. Toward the end of the second month of ambulatory treatment the strength of the intravesical irrigating solution was reduced to .25 per cent, one quart being employed. The same treatment was continued for a few days, after which the urine was free from shreds and pathological epithelia. The bladder capacity had increased to 10 ounces. My attention was first called to nargol by Dr. L. W. Bremerman, of the New York School of Medicine, for which service I shall always feel indebted to him. It was while acting as his assistant that I had an opportunity to study nargol and its effects. I regard it as the best of all the silver salts for genito-urinary infections and inflammations in cases similar to the one described.

SPECIAL ARTICLES.

THE SOCIAL EVIL.

III. CONTRIBUTING FACTORS—DRESS.

It is then clear that civilization is a form of social progress characterized by the repression of those primitive impulses now known to us as passions and emotions, to correspond with the obligations of social life. It necessitates the surrender of the rights of the individual for the good of the many. These rights have been abolished one by one, and the adjustment to the new order of things effected so promptly that society has forgotten that individuals formerly looked upon certain privileges as rights, and the individuals themselves scarcely miss them. It is only when some new move to narrow the confines of personal liberty is made that opposition is aroused and an outcry made.

In our former argument we showed that the existing order of things having been instituted by the majority of individuals, there is always a diverging minority to whom it seems tyrannous, and whose sympathies are with the individual against society. Such are either abortive in development, or degenerate in intellect and morals. They do not progress, but tend to retrogress. They cling to the present order of things, thus obstructing progress, or they revert to the former order of things and so retrogress. Primitive ideas are difficult to outlive. We all feel their force, and the only successful method of avoiding social disorder is by vigilantly and intelligently repressing them. Thus, though our civilized homes are filled with comforts unknown to primitive man, each of us has an undefined longing for the freedom of the savage in forest and plain. Though food comes to us in improved quality and regular quantity through the inexhaustible channels of agriculture, we have the same undefined longing for the chase. To yield to these impulses is to become a vagrant, and no doubt vagrancy depends as much upon failure to repress these impulses as upon the indolence to which it is commonly referred.

Yielding to the primitive impulse to avenge an injury terminates in assault and murder; to possess oneself of property, to theft; and to gratify the sexual passions, to seduction, fornication, and rape.

We have already seen that the sexual passion takes the first place among the primitive impulses, being stronger in some cases than the impulse of self-preservation. It is therefore fair to presume that its regulation was one of the last to receive attention—for a majority did not feel the need of it until other abuses of society had long been corrected. It is also fair to suppose that its repression met with greater opposition than that of any other impulse for the same reason. The failure to uniformly and successfully repress it has made sexual misconduct the most common of the social crimes of the present time.

Society lingers regretfully upon the shores of the primitive state and reluctantly launches forth upon the great ideal. So many look longingly back upon the sensual enjoyments of the primitive sexual relation that it seems as if society as a whole can never get entirely out of sight of them. Indeed, it seems as though almost every one now and then takes a surreptitious peep at the receding horizon, even though long since out of sight of its alluring dangers.

But we are traveling onward, mercilessly driven by those about and behind and beckoned by those before, and whether we desire it or not, the blessings and the curses of civilization are forced upon us. Step by step we are getting away from the primitive and natural to

the ideal and artificial, each step showing us new beauties and advantages, but each changing our relation to our environment. It is like leaving the freedom of the country and forest for the city park with all its odious "keep off the grass" signs.

But there is another reason why the sexual impulse must be the last to receive regulation, why only its greatest abuses have thus far been overcome, and why the remainder are difficult to regulate. It is a necessary impulse. Society is better off with the impulses of revenge and avarice completely extinguished, but should the sexual passion be extinguished society itself must cease to exist. It is therefore of fundamental importance, and it seems as if in anticipation of the effort of intelligence to antagonize it nature has exalted the passion as it has developed the intellect, so that the number of human offspring might not be diminished. The evolution of intelligence therefore brings to man the power to regulate, but fortunately not to extinguish, the sexual impulse. The artifices of civilization, though busy with its regulation, are also engaged in stimulating the sexual appetite, and society is curiously enough in the ambiguous position of fostering what it finds so important to regulate.

The lower animals spend the greater part of their time in self-support. With them life is a constant struggle against starvation, the elements, and their enemies. With primitive man it was the same, and comparatively little time was found for amusement or diversion; but with civilization the difficulty of living has become less and the time for enjoyment greater. The enjoyments of animals are few. They no doubt experience sensations of pride in physical beauty and strength, satisfaction in successful conquest, and pleasure from the caresses of their mates, but beyond this their capacity for enjoyment is limited. With primitive man it must have been much the same, but as man evolved from the primitive to the complex his increasing intelligence afforded him new opportunities for enjoyment as well as additional time and means for it, so that at present there are large numbers of individuals among us who, having overcome all necessity by the accumulation of goods, have unlimited time for enjoyment and devote themselves to devising new means of obtaining it. It was this invention of pleasure-giving devices that marked the transformation of mankind from the animal to the intellectual, from the natural to the artificial.

Many pleasure-giving inventions have a direct bearing upon the sexual relations, but most of all those that come within the domain of esthetics.

Among animals and among primitive peoples sexual selection is natural; among civilized peoples it is artificial. Animals and primitive man choose their mates because of natural characteristics and charms they possess. The strongest male took by right of might the fairest female; the fairest female waited the coming of the lord and master and unhesitatingly accepted him.

Primitive man was without clothing or adornment, and the physical characters were exposed to view. The fairest female was therefore the one with the greatest physical perfection—sexual charm. By picturing to ourselves this primitive condition and these natural tendencies, and remembering that amid the encumbrances of our present complicated social condition there is always a tendency to revert to them, we can best come to an intelligent comprehension of many of the inconsistencies of civilized social life.

Society now looks upon clothing as an essential safeguard against sexual excitement, and no doubt it is such in most cases.

Early in the history of human existence man —probably woman—began the intensification of natural beauty by artificial means, and so

B. J. C.

began the substitution of artificial for natural selection, for it could not have been long before it was discovered that artifice could disguise or conceal many of the minor natural defects.

Adornment in warm climates and necessity in colder ones soon caused more and more of the natural beauty—nudity—to be covered, and more and more of the artificial beauties to be displayed, until instead of the sexually perfect body in its pristine nudity that was the attractive element in sexual selection, it gradually became the face and the adornment. This is where we find ourselves to-day. We court a face and a costume! We see the face, but what is under the costume! Artifice disguises it, and if the face please we hope the body will also. Is it any wonder that among some civilized peoples of the past and present it is considered immaterial whether a man sees his wife before he marries her or not? He does not know what he is getting at any rate, hence what matter about the face? And is it any wonder that among such people, where intelligence and sentiment play little or no part in the sexual relationship, there should be no sympathy between man and wife and the relation be purely a sensuous one?

The emotion of modesty developed with the costume. It probably began as a feeling of embarrassment at being seen without the artificial advantage. Among nude savages we learn that nudity is no source of embarrassment, but that the absence of such decoration as is fashionable at the time throws the woman into confusion. The more extensive and elaborate the decoration, the greater its absence is deplored and the greater the confusion of the "undressed" individual. This continues until clothing has become a necessity of society everywhere, and to be seen without it is not only regarded as indecent but a misdemeanor. And now see how custom has stepped in to complicate the matter with conventionalities too numerous to receive more than the most superficial mention. The body is equally well covered with underclothing and the nudity entirely concealed from view, but to be seen without the outer clothing causes most painful blushes and throws both sexes into confusion. Then what is a disgraceful exposure of the body at one time is quite within the limits of propriety at another. Thus a girl who would be shocked to show her garter in street dress is proud to appear upon the sand in a conventional bathing costume that may show both —and much more. The same girl would blush to see a square inch of skin above her gallant's sock in the parlor, but meets him on the sand dressed in a costume that society tolerates, though it exposes much more of his skin than it covers. So we find that modesty depends entirely upon convention in dress and can be modified to suit the occasion.

But the development of the costume has done much to influence the sexual relation in society, for the primitive instinct is behind it and it is a means of evil as well as of good. Through the dress we catch glimpses of the primitive state and our instincts are awakened. Nay, the dress may be employed as a means of awakening those very instincts.

How soon women learned the art of dressing "well!" What does the expression really mean? Simply the setting off of the concealed figure so that it is no longer concealed. The sexually well-developed woman arranges the details so as to show her development to the best advantage. The less developed through artificial devices endeavors to imitate her, sometimes with success; sometimes with failure. See yonder courtezan: does she not know just what adjustment of gown to figure will proclaim her to those for whom she drags her net? If this be so, dress loses its value as a safeguard to society.

Then there are the special costumes that society legitimizes for special occasions. These assist in getting back again to primitive con-

ditions, and by so doing cannot fail but arouse the primitive impulses.

Can a man be oblivious to the comely limbs exposed by the bathing dress, or close his eyes to the rounded bust displayed by a ball dress. These show the sexual perfection of the wearer, and their attraction is certainly felt. Not necessarily by all, not by those most accustomed to repress the primitive impulses; but how about others? How about that large number in our midst whose sexual inclinations exceed their discretionary powers? How about the novice and rustic? Watch their eyes at any fashionable gathering in evening dress and see how they hang upon the shapely bust of one woman instead of the fair face of another. Why? Because they see the sexual perfection of the one and are drawn to her rather than the other, whose disguise is impenetrable. You don't believe this? The courtezan understands it, and wears the lowest neck and exposes the greatest extent of bust.

So dress not only acts as a means of repressing the sexual sense by hiding the attractive features of the individual, but also as a means of arousing it by exposing those of another.

It has already been pointed out that sexual satisfaction is the fundamental basis of happy marital life; also that though every man is attracted by a pretty face few can be contented with it. Therefore when a man woos a face and a costume, to find that inside the costume to be deformed or ugly, his chances of satisfaction are diminished. Happily the intellectual and the spiritual play so important a part in the intimacy of the married life of the majority that this must be a rare and unimportant cause of disaffection, yet in some cases it is doubtless a real one, and its possibility should be shown to the prospective bridegroom in that education to which reference has been made as so important in enabling him to escape from incompatible marriage.

So in dress, which we assume to be a means of repressing the primitive impulses by concealing that which arouses them, we find ourselves inconsistently adopting forms of dress by which the desired end is controverted.

NEURALGIA AND HEADACHE.

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(*Clinical Journal*, Aug. 22, 1906.)

Pain which follows the distribution of certain nerves is a very common affection. In the form of sciatica, cervicobrachial neuralgia, and some others it is most often due to a fibrositis or inflammation of the white fibrous tissue in the nerve-sheath and its immediate neighborhood, and is then much influenced by changes in the weather. "Sciatica" is a condition with which patients are very liable to come with a diagnosis ready made—a diagnosis against accepting which we should always be especially on our guard. According to F. J. Smith,[1] if the pain is markedly worse at night, or if both sciatic nerves are involved, it is tolerably certain that some cause more serious than a mere inflammation of the nerve-sheath is in operation. For it is to be remembered that pain along one or both sciatic nerves may be due to various causes. It may result from a loaded rectum, from uterine and ovarian displacements, from tumors and disease of the spinal cord itself, and such possible factors should always be very carefully and exhaustively investigated before the pain is pronounced to be due to a neuralgia, and treated as such. For this purpose it is important to determine whether the pain is due to pressure, or whether it is caused by some factor in the nerve itself or in its sheath. In the former case the pain will not be sensibly aggra-

[1] *Clinical Journal*, Dec. 27, 1905.

vated when the nerve is put on the stretch—it may, indeed, be to some extent relieved by the process; whereas when the mischief is in the nerve or its sheath, stretching will obviously increase the pain. In order to set this point at rest the patient is placed upon his back, and the pelvis firmly fixed against the bed by an attendant. The limb on the affected side, which must be kept fully extended at the knee, is then gently and gradually raised by the examiner until it is at right angles to the couch; this will put the nerve on the stretch, and if no aggravation of pain results, then the cause is to be sought outside the sheath of the nerve; it is not due to a fibrositis, and the condition is not, properly speaking, a sciatica.

So far as the treatment of sciatica is concerned, it may be said to consist in the cleansing of the primæ viæ, the regulation of the diet, and the application of massage. Dr. Lee[2] says: "It is in sciatica, of all the neuralgias, that massage has won its greatest reputation. Truly astonishing results have been obtained even when the affection has been of many years' standing, and after every other conceivable means of relief has proved unsuccessful." This coincides completely with my own experience, and since I have used massage perseveringly, assisted in suitable cases by douching and the application of stimulating liniments, I have had no occasion to resort to acupuncture, surgical stretching of the nerve, the actual cautery, blistering along the course of the nerve, and other heroic remedies which are often recommended, and which the tedious nature of these cases so often suggests to the despairing physician. If massage were employed early in all cases, few would become chronic, and if it is persevered with, in cases which have become chronic, even to the causing of marked wasting of the muscles, it will in time always bring about a cure. Some of the antineuralgic drugs, which will be noticed presently, may also be used concurrently. Some of them, especially phenozone and butyl-chloral, have often seemed to me to do good in the way of rendering the massage more tolerable. Without massage these drugs may be palliative, but they are never curative, as they are in neuralgia due to causes other than fibrositis.

Among the causes other than fibrositis which produce pain along the distribution of certain nerves the most important are unsatisfactory blood states. That neuralgia is the cry of a nerve for healthy blood is an oft-quoted saying, and certain it is that undue toxicity of the blood, from whatever cause arising, is an important, as it is certainly the most common, agent in the causation of pain. For toxins in the blood act, not only by direct irritation of a nerve, but they also act, as in gout, by causing vasoconstriction, thus depriving the nerve of its due quantity of nutritive material. Burney Yeo[3] suggests that a factor of an opposite kind is not infrequently in operation, namely, that the blood state may give rise to vasodilatation, and that it is a kind of local blushing in the neighborhood of the nerve which determines the pain. However that may be, all that it is necessary to realize is that impure blood is the most important cause of neuralgia, and that it may produce this effect, not only directly, but also by interference with the normal vasomotor mechanism. Another cause, scarcely less in importance, is the existence of an irritant causing fatigue of the involved nerve.

The presence of a neuralgia, then, should suggest (1) a fibrositis, (2) an unsatisfactory blood state, and (3) the existence of an irritant. With the first I have already dealt; there remain therefore the other two to consider. Of unsatisfactory blood states the com-

[2]Hare's Practical Therapeutics.

[3]"A Manual of Medical Treatment." See also F. A. Hare, *Clinical Journal*, etc.

monest is surely anemia. Whether this be due to convalescence from acute disease, or to mere chlorosis, or to deficient coagulability of the blood[4] or other cause, it is very frequently attended by neuralgia, more especially about the head and lower part of the trunk on one side. The treatment of such cases resolves itself into the treatment of the anæ by suitable hygienic, dietetic, and medicinal means. So far as hygiene is concerned, an out-of-door life in a bracing climate is strongly to be advised; the diet should be generous, including meat foods and wines, preferably a good Bordeaux or Burgundy, and plenty of fats. Fats seem to be concerned in some very special manner with the nourishment of the nervous system, and in the form of butter and cream they may be freely given to such patients as we are considering. The best medicine is undoubtedly iron, but the stronger salts, the sulphate and perchloride, are much less efficacious than the citrates and tartrates. The latter are readily assimilated, whereas the former are very apt to upset the stomach. A useful formula is as follows:

℞ Ferri ammon. citrat.....gr. x.
Liq. arsenicalis .....m. ij.
Inf. quassiæ .....ad ℥ss.

M. Sig.: Ter die post cib.

As strength improves it may be desirable to substitute the following:

℞ Ferri quin. citrat.....gr. xx.
Liq. arsenicalis.....m. v.
Tr. nucis vom.....m. iv.
Aq. aurant. flor.....ad ℥ss.

M. Sig.: Ter post cib.

The presence of the quinine, even in such doses, may help to subdue the neuralgia. When giving iron in any form and for any purpose it is of the utmost importance to keep the bowels open. This is best done by means of aloes at first (because this drug enhances the effect of the iron), and later by cascara. A daily morning dose of a natural mineral water is also very useful.

But where the neuralgia is an obtrusive feature of the condition it is generally necessary to prescribe something which has a direct influence upon the pain when it occurs. In anemic cases, and in all those in which defective nutrition is pronounced, I have had better results from quinine and gelsemium than from any other combination.

℞ Quin. mur.....gr. v.
Acid. hydrobrom. dil.....m. xx.
Tr. gelsemii.....m. x.
Aq. chloroformi.....ad ℥ss.

M. Sig.: Every twenty minutes till pain ceases. Not more than four doses to be taken.

This mixture, like most others where the relief of pain is concerned, acts better in small doses repeated at short intervals than in single large doses.

The state of the blood in goutiness is such as to be highly provocative of neuralgic pains. Inasmuch as this condition and its treatment has been previously considered,[5] it is here only necessary to emphasize the advisability of examining for high arterial tension in all cases of neuralgia, and where this is present to point out the value of iodide of potassium in the treatment of the accompanying neuralgia. As this drug is the most potent of all others in counteracting the gouty state generally, a gouty neuralgia ought very readily to yield to the measures proper to the treatment of the blood state itself. Occasionally, however, it does not, and then it is well to have recourse to the following combination:

℞ Sodii salicylat.,
Phenozone .....ää gr. v.
Syr. zingiber.....3j.
Aq. chlorof.....ad ℥ss.

M. Sig.: Every quarter of an hour until pain ceases. Not more than four doses to be taken.

[4]Ross: *Lancet*, Jan. 20, 1906.

[5]"Goutiness." *Clinical Journal*, Jan. 31, Feb. 7 and 14, 1906.

This is a most admirable combination in the migrainoid neuralgic attacks to which the gouty are peculiarly prone. I have appealed to it in a very large number of cases, and, so far, never in vain. For a reason which I do not pretend to be able to explain the combination of these two drugs is infinitely more effectual than either given alone. When directed to be taken as above the combination acts better than in single large doses.

A fruitful and easily overlooked cause of neuralgia, especially in women, is the toxic blood state induced by chronic constipation. This must be treated by the curing of this vicious habit on the lines already laid down,[6] but here, again, we may have to treat the neuralgia concurrently with the treatment of the constipation, in which case the phenozone and salicylate mixture just described will usually be found the most useful, though quinine and gelsemium are to be preferred where, in consequence of the long duration of the constipation, the patient is anemic and emaciated.

Neuralgia is considered by some as a hysterical manifestation. This, of course, it may be, though hyperesthesia is less characteristic of hysteria than anesthesia. Neuralgia certainly occurs frequently in neurotic women, but I have generally found that there is some discoverable and removable cause for the neurosis of which the neuralgia is an occasional manifestation, and this cause is more often than not a peripheral irritation of which the origin is to be found in the teeth, the ears, or the eyes. Such irritation, when acute, is a recognized cause of neuralgia in those who are not neurotic, and there is no difficulty in supposing that when chronic it may give rise to that nervous instability to which the term "neurotic" is applied. A common site for such irritation is the ovarian region. Examination of this region in neurotic women will often reveal pain on pressure over one or both ovaries, in which case infinitely the best drug to use is belladonna. It is usefully combined with phenozone, and its administration should always be accompanied by the application of blisters, small in size, but frequently repeated, in the region where the pain has been elicited. A practical point of considerable importance in connection with the management of these cases is characteristically expressed by Goodhart in that altogether admirable little work "Common Neuroses" in the following passage: "I have said it is a bad day for a man when he first knows he has a heart; it is a ten times worse day for a woman when the pelvic pains to which so many are subject are focused for her by medical opinion upon uterus or ovary. If there is anything which curdles my blood it is to hear a woman talk of her ovaries as she might of some intimate acquaintance." In the manufacture of incorrigible neurotics the word "ovarian," blurted inadvertently from incautious lips, is a common and potent ingredient.

Irritation within the buccal cavity is a frequent cause of facial neuralgia, and it should be remembered that it is not only teeth which are obviously carious which may produce this result, but, as Savill[7] points out, careful examination, by tapping the teeth, or by the application of hot and cold liquids alternately, will often reveal the existence of an irritated pulp in an apparently sound tooth, the proper treatment of which is necessary to a cure. For the relief of neuralgia of facial or cranial distribution arising from such a cause, butyl-chloral is probably the best of all internal remedies. It should be given in pill form, 5 grains every half-hour until pain ceases, not more than six pills to be thus taken. It is usefully combined with gelsemine, which is another drug with a selective influence over cranial neuralgias. For

[6] *Vide Clinical Journal*, Aug. 23, 1905.

[7] A System of Clinical Medicine, vol. ii.

this purpose the pil. butyl-chloral c. gelsemina (Martindale) is very useful. Local applications are not usually accounted of much value in facial neuralgia, but I have found that the lin. aconite carefully painted with a camel's-hair brush over the area occupied by the pain is not only helpful in assisting the action of drugs taken internally, but that it is in some cases sufficient of itself to cut short an attack. For the vague, ill-defined, neuralgic and "rheumaticky" pains of which people not infrequently complain I have found chloride of ammonium, gr. 20, combined with tr. cimcifugæ, min. 20, more effectual than any of the above-mentioned remedies.

One of the most valuable drugs for the relief of neuralgic and neuritic pains, wherever situated, is acetanilide (antifebrin). In spite of its undoubted powers in this direction, even where such pains as those of tabes are concerned, it has of late fallen into disuse. This has been due in a large measure to the fact that it is credited with the production of untoward effects. This is in reality only partly true. If the drug is properly employed it is no more dangerous than any of the numerous drugs which daily flow freely and callously, so to speak, from the point of the prescriber's pen. First, then, as to dose. The official dose of 10 grains is too high, at any rate to start with. It is better to begin with 2 grains, which will in many cases be found sufficient. If not, the dose may be gradually increased to 10 or even 15 grains. It should not be increased above the latter if, the physiological effect having been produced, the pain fails to yield. This physiological effect is slight cyanosis. The lips and nails become a dusky-red. This effect has in a great measure been responsible for the disuse into which the drug has fallen. There is nothing alarming about it, and it is necessary to remember that, as in the case of so many other drugs, the curative virtues of acetanilide very often refuse to show themselves until this physiological effect has been evoked. These facts seem worth insisting upon because, apart from morphia, acetanilide is, in my judgment, by far the most powerful antineuralgic at our disposal. It will relieve the pains of locomotor ataxia and of other organic diseases of the nervous system when nothing else will, and he who allows himself to be frightened by the occasional cyanosis which it causes deprives himself of a most valuable therapeutic agent. That its use requires a certain amount of caution is not a sufficient reason for abandoning it. Acetanilide, being practically insoluble in water, is best given in cachet combined either with salicylate of sodium (gr. 10) or camphor monobromat. (gr. 6).

It is scarcely necessary to mention morphia as an antineuralgic except to say that it is not employed as often for this purpose as it might be. It is, of course, most undesirable that its use should be prolonged, but there is no objection to exhibiting it for the relief of pain pending the action of other remedies. For the intense neuralgia which sometimes accompanies true influenza and other acute toxemias it has no equal. Its use in recurrent neuralgias is undesirable, not only on account of the patient, but also for the sake of the practitioner, who, unless he is careful, will find himself urgently summoned at all hours of the day and night to administer the necessary dose. This, which is unsatisfactory enough, is on the whole preferable to entrusting, as is too often done, the patient with a needle and a bottle of tablets.

Another unduly neglected means of relieving neuralgic pains, in suitable cases, is leeching. One would not, of course, recommend it in weakly, anemic subjects, but in full-blooded individuals the relief it gives often approaches the miraculous. This is especially true where the pain seems to be in, or to radiate from, the ear. A leech placed behind the ear and allowed

to take its full quantity of blood will often give complete relief where other means have failed.

There remains to be considered a highly important and perhaps the most important of all peripheral irritants in the causation of neuralgia, which I have left to this stage that I might discuss it in association with headache, to which it also gives rise with great frequency, namely, eye-strain. Where eye-strain is concerned, neuralgia and headache may be regarded as synonymous terms, for it is impossible to be certain where the one ends and the other begins. And I may say at once that these two conditions by no means exhaust the troubles to which eye-strain may give rise. It is, as we shall see presently, a frequent, though too often unsuspected, cause of neurasthenia, melancholia, intemperance, and drug habits, to say nothing of such minor matters as irritability of temper, dyspepsia, constipation, and "sluggish liver."

The first point to remember in connection with eye-strain—and it is one upon which it seems very necessary to insist—is that the condition is produced, not by gross defects, but by slight ones; not by high degrees of errors of refraction, but by minor ones.[8] So much is this the case that patients are often indignant that any aspersions should be cast upon their eyesight, which, they will protest, has always been exceptionally good. And the truth is that such patients *are* able to see as well as any one, for the reason that, the defect being slight, it has always been well within their power, by contracting the ciliary muscle, to overcome the defect. In the case of those with gross defects no amount of contraction enables them to see clearly, and so the effort, even if it is ever made, is very early abandoned. In the case of those with minor defects the difficulty arises from the fact that it is no more possible to keep the ciliary muscle contracted for hours on end with impunity than it is to keep any other muscle in the body so contracted without fatigue. Especially does this apply when astigmatism is present, as the ciliary muscle is then contracted, not only continuously, but also irregularly. The difference between the ciliary and other muscles is that in the latter the symptoms of fatigue are easily recognizable and are at once referred to the seat of origin, whereas in the case of the ciliary muscle these symptoms are not easily recognizable, and so long as the vision remains unimpaired the seat of origin is almost certain to go undetected. The patient sees well, but in the majority of cases he does so at a cost which, physiologically speaking, he cannot afford to pay. He lives well up to the limit of his nervous income, and any slight unexpected expenditure in other directions, such as anxiety or a dyspeptic attack, will very readily project him into bankruptcy. It is when he has reached this state that he appeals to his doctor to be relieved of a headache or an attack of neuralgia. For, be it remembered, the pains which are caused by eye-strain are by no means always present; frequently, indeed almost invariably, they require some extraneous cause to provoke them. As long as the patient is permitted to pursue the even tenor of his way, he is able to live within his income and keep his enemy at bay, but no sooner is that even tenor disturbed, as by worry or an overgenerous dinner, than he finds himself at the end of his resources, with his enemy at his throat. The factor which in a very large number of cases supplies the disturbing element is the advance of time. As long as a man is young and vigorous his nervous income is equal to almost any strain; but as years wear on this income gradually diminishes, and as he approaches the presbyopic age, when another disturbing element awaits him, he is always more or less on the margin of

[8] See "Refraction of the Eye," by Ernest Clarke (Baillière, Tindall and Cox).

symptoms. When the presbyopic age is actually reached and the lens has lost a great deal of its original elasticity, the ciliary muscle has still more work thrown upon it, and consequently such symptoms are liable to be of very frequent occurrence.

The nature of these symptoms varies within very wide limits. Neuralgia and headache, with which we are for the moment especially concerned, take the first place. Neither the distribution of the neuralgia (except that it is generally cranial) nor the type of the headache afford any indication that it is the eyes which are at fault, so that it is all the more important to keep constantly reminding ourselves of the now well-established fact that where either of these symptoms cannot be traced to any obvious cause eye-strain is, in all probability, the main factor in their production. Another common effect of refractive errors is giddiness. This is liable to occasion very considerable alarm to patients, who are generally afraid that it indicates intracranial mischief. To medical men it generally suggests gastric disorders, aural troubles, or circulatory disturbances. These are all common causes, but probably the most common, especially in people about middle life, is that which is least frequently remembered, namely, ocular defects which are slight and therefore unsuspected by the patient.

Nausea and vomiting are often due to eye-strain. In these cases, as in most others, it is to be remembered that something more than eye-strain itself is required to precipitate an attack. That something is often so slight a matter that it altogether escapes notice unless the presence of eye-strain, acting as a chronic underlying irritant, is realized. In all these cases it is the summation of slight stimuli which produces the effect, and of these slight stimuli that which is constant and ever present is the one whose removal is important. With that gone the others cease to be operative.

But the manifestations of eye-strain are not all as definite as the foregoing.[9] The condition, indeed, expresses itself even more frequently in forms which, until we are familiar with its almost unlimited capacity for producing indefinite symptoms, are very difficult of recognition. "The Autocrat at the Breakfast Table" says that "it is better to lose a pint of blood from your veins than to have a nerve tapped." Now, that is precisely what eye-strain does. It taps a nerve; the energy runs to waste and the whole cerebrospinal system becomes exhausted. When once the outline of this picture is clearly discerned, it is by no means difficult to fill in the detail. For cerebrospinal exhaustion, though it has no symptoms by which it may with certainty be recognized by the doctor, has a very real existence for the patient. In its slighter degrees it may mean no more than the deprivation from a particular viscus, say the stomach, of its fair share of nervous energy, leading to dyspepsia; or it may spell an evident want of control in the higher cerebral centers, causing irritability of temper, undue emotionalism, or a craving for stimulants. In more pronounced degrees it will cause the grouping of symptoms to which the term "neurasthenia" is applied; it may cause hysterical ebullitions, and may even be responsible for epileptic attacks. In degrees still more pronounced it may lead to melancholia and even to suicide. There is, in short, no functional disturbance of any portion of the central nervous system which may not own eye-strain as its essential cause, so that it is impossible to insist too strongly upon the importance to every practitioner of being able to detect slight errors of refraction when they exist. Into the details connected with the necessary examination it is impossible to enter here, but the following hints may serve as a useful guide:

[9] See "The Medical Aspect of Eye-strain," by Ernest Clarke, *Clinical Journal*, October, 1905.

(1) OBJECTIVE EXAMINATION.

(*a*) Defects of vision may be suspected if the patient screws up his eyes or places his head on one side in order to read or to see some object at a distance. If there is a hyperemia of the margin of the lids, generally the upper lid, an error of some kind is usually the cause, and if a patient under forty years of age presents an arcus senilis, especially if one eye only be thus affected, it is almost certain that the premature degeneration has been brought about by eye-strain of some kind.

(*b*) If the eye is examined by the *indirect* method with a concave mirror and focusing glass:

Hyperopia is present if the disk is larger than usual and diminishes on withdrawing the glass from the eye.

Myopia is present if the disk is smaller than usual, and enlarges on withdrawing the glass, and

Astigmatism is present if the disk is oblong and alters in shape on withdrawing the focusing glass.

(*c*) By *direct* ophthalmoscopy:

Hyperopia is present if convex glasses improve the view of the fundus, *myopia* if concave glasses do so, and *astigmatism* shows itself by parts of the fundus being out of focus while other portions at right angles are in focus.

(2) SUBJECTIVE EXAMINATION.

Hyperopia is probably present if the patient's vision is not made worse by convex glasses.

Myopia is suspected if the patient's reading distance is nearer than normal; and

Astigmatism if the patient can read some of the letters in the lowest line of the distant type but makes mistakes even when reading a line half-way down, or if when looking at radiating lines put at a distance of 4 to 6 meters some of the lines look blacker than others.

It must, however, be distinctly borne in mind that these tests, if *negative,* prove nothing if the patient is not under the influence of a cycloplegic, as he may be, and probably is, involuntarily correcting his error.

Eye-strain is, however, by no means the only kind of chronic peripheral irritation which may give rise to headache. Dental troubles which fall short of gross caries frequently produce it, overcrowding of the mouth owing to eruption of the wisdom teeth being a common and often unsuspected cause. Impairment of respiratory power, brought about by obstructions in the nose and throat, are other easily overlooked causes, chief among them being deviations of the septum and other factors acting upon one nostril only. Aural troubles of every sort should always be carefully examined for.

A form of headache which presents special features and concerning whose etiology there has been a great deal of speculation is migraine or hemicrania. The latter name is applied to it because the pain generally begins on one side of the head, and is sometimes confined to that side throughout the attack. The characteristic of migraine is its periodicity. The attacks recur at intervals, though not necessarily at regular intervals, and their origin is exceedingly difficult to trace. Migrainous people, like epileptics, are always more or less liable to an attack, and, like epileptics, they have premonition; they know the sort of influence which may affect them, and immediately after an attack they know that they will enjoy immunity for a variable time. The attacks usually begin, significantly enough, with some ocular phenomenon, such as flickering lights of various forms and zigzag lines of colors in different parts of the field of vision. Then follows an intense headache, accompanied generally by nausea, vomiting, and extreme prostration, which may last for varying periods. At the end of forty-eight hours the patient is

generally well again. To understand the phenomena presented by migraine we have, as in epilepsy, to assume some underlying instability of the nerve centers, which are provoked into a stormy condition by stimuli which pass by ordinary individuals without effect. The attacks are common in the studious, in the sedentary, in the highly-cultured, and are rare in the bucolic. In the light of what has been said above on the question of eye-strain and the capacity of this condition to produce a disturbance of nervous equilibrium, coupled with the fact that migrainous attacks are almost invariably accompanied by ocular phenomena, very especial care should be taken to eliminate this element in every case. A very large number of people have slight defects of vision, and such slight defects, while harmless to the peasant of robust organization, may very readily provide a constant irritant to the studious of delicate organization, and thus contribute a powerful underlying cause for the attacks. A migrainous person should be examined very minutely by physician, oculist, aurist, and gynecologist, and any defect in any department, however slight, which could possibly act as a cause of irritation, should be removed. The physician should pay particular attention to the cardiovascular system, the oculist to the state of the refraction, and the aurist to any remediable errors either in the ear, throat, or nose. If nothing can be discovered, then we are reduced to attempting to lessen the general nervous reactive sensibility by hygiene, diet, and the exhibition of bromides. A country, open-air life, a diet free from stimulating foods and alcoholic drinks, and the bromide of ammonium in 10-grain doses, three times daily, for a week every now and again, will very often keep the enemy at bay. During the attacks rest and a darkened room are essential. When taken in time—that is, before the attack has had time to develop—the phenozone and salicylate mixture above prescribed will often, indeed generally, act admirably. I have found it superior to phenacetine (gr. x), in which some people, however, express great confidence.

Upon headache as a symptom of intracranial mischief it is unnecessary to dwell. When the pain, as in migraine, is accompanied by vomiting, the fundus oculi should always be examined for anything suggestive of optic neuritis, and careful search should be made for other physical signs of organic disease in the nervous system. Intracranial tumors and meningitis are causes which should always be borne in mind.

There is a certain class of headache which is occasionally described as congestive. The term is misleading because headaches due to a diversity of causes might legitimately be so called. If, however, we qualify the term by the adjective "mechanical," it is possible to recognize a separate and distinct group. Headaches due to mechanical congestion are produced by factors which are easily overlooked. Anything which interferes with the proper circulation of the blood may occasion them, and in ordinary life tight corsets in women and tight collars in men will be found to be common causes. This type of headache, which is described as a general fulness, aggravated on stooping, may be the first indication of the existence of a lesion at the mitral valve, so that a complaint of such nature, more especially when it is accompanied by a history of epistaxis, should always lead to a careful examination of the cardiac area. Nasal obstruction, whether from enlarged tonsils, adenoids, or deviations of the septum, is exceedingly likely to cause headaches of the congestive type. The two former are nowadays very readily recognized, and very promptly—perhaps too promptly—removed, but the latter is often allowed to continue unremedied. Nasal

deformities constitute an exceedingly common cause of headaches in adults, and as they are now easily remedied there need be no hesitation in advising their radical cure, even in people who are past middle life. The correction of these deformities must be left to the expert, but I would suggest that the most speedy, complete, and lasting benefit is to be obtained from the recently introduced method of submucous resection, by which the cartilaginous and bony obstruction is entirely removed, leaving a fleshy septum, an intact mucosa, and a clear air-way.[10]

Headache is very often caused by change of climate. The removal of a person from sedative to bracing conditions, and even more frequently *vice versa,* commonly brings about changes in the vascular pressure, which, in the absence of adequate reactive power in the individual (in the convalescent for example) very frequently cause headache and depression of spirits. If these symptoms do not pass off in a few days, it may be necessary to resort to treatment. Where the headache has been induced by relaxing climatic conditions a mixture containing 2 grains of quinine and 5 minims of liq. strychnin. will generally do all that is necessary. Where, on the other hand, the climate is "too strong," as the expression is, 10 grains each of the iodide and bromide of potassium, three times a day, will be found useful. In each case the mixture should be preceded by a dose of calomel.

Pain in the head of a superficial character, such as seems confined to the scalp, is a frequent accompaniment of "colds" in the head. In such cases the pain is usually due to a fibrositis of the tissues overlying the skull, and is to be treated on lines already suggested. Headache is a common symptom of neurasthenia.

Most headaches are due to what are comprehensively described as blood-states. A good instance is supplied by chlorosis, in which the headache is due to the abnormal condition of the corpuscular elements, and the same is presumably true where the symptom appears in leukemia and other associated conditions.

The offending blood-state in the majority of cases is, however, a toxemia. There are numerous familiar instances of this. All the acute specifics are liable to be ushered in with a headache more or less severe, and the poisons of alcohol and lead almost invariably cause the symptom. Among the toxemias due to defective excretion, kidney disease and diabetes are classical instances of causative factors, while chronic constipation is probably both the commonest and the most generally overlooked. In all these cases the discovery of the cause immediately points the way to the proper treatment, and some people have endeavored to aid in the discovery of the cause by an attempt to map out certain cranial areas in which pain occurs and attaching to each area a particular group of causes. Thus, pain which is mainly vertical is said to be due to the following: anemia, hysteria, neurasthenia, epilepsy, and disease of the uterus and appendages. A headache which is chiefly frontal is deemed gastrointestinal, renal, ocular, syphilitic, or myalgic. An occipital headache is considered suggestive of intracranial mischief and spinal irritation. While believing a great many of these to be fanciful, I think there is no doubt that headaches due to defective elimination, such as those caused by uremia, diabetes, constipation, and impure atmospheres, are generally frontal, and that those which appear in functional nervous troubles seem to have a preference for the vertex, but even in such cases it is not wise to attach much importance to so variable an element as the site.

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[10]St. Clair Thomson: Proc. Laryngol. Soc. Lond., May and June, 1904; Trans. Clin. Soc. Lond., Oct. 25, 1905; *Lancet,* June 30, 1906.

In every-day life it is certainly the toxins of gastrointestinal origin which are most frequently responsible for the occurrence of headache. These toxins most frequently act by interfering with the intracranial vasomotor mechanism, causing now undue contraction and anon undue dilatation of the cerebral vessels. The indications in either case are the same, namely, to cut off the supply of the toxins and to promote the excretion of those already in existence. The means of doing this I have already discussed,[11] so that here it is only necessary to emphasize the importance of dietetic simplicity, such as absence of meat foods and alcoholic drinks, and of excretory vigor by means of purgatives and diuretics. Stress may perhaps be laid on the importance of the latter, which seem very generally to be neglected. The salts of potassium, especially the iodide and the citrate, are most useful, but the best of all renal stimulants is undoubtedly theobromine. Some physicians who are possessed by the uric acid bogey object to this drug on account of its close relationship with xanthine and the other purin bodies. An overcurious regard for these would, however, lead also to the condemnation of caffeine, whose efficacy as a heart tonic in suitable cases is second only to that of digitalis. Whatever its connection with other bodies with the radical C_5N_4, and however dangerous such a connection may prove it theoretically to be, there can be no doubt that, clinically, theobromine is the most active renal evacuant we possess, and it may be prescribed with every confidence in all cases where we are desirous of ridding the system of a toxin, such as a nitrogenous toxin, which is normally disposed of through the kidneys. It is best given in cachets of 15 to 20 grains three times daily. It occasionally operates as a drastic purgative, in which case the dose must be lessened. Some people prefer to give it in the form of diuretin, in which it is combined with a salicylate.

In addition to general evacuants it is generally desirable to prescribe measures directed to the relief of symptoms. Where there is reason to suppose that the headache is due to vasoconstriction, liq. trinitrin is very useful. Its effect, however, is transitory, and it should not for obvious reasons be frequently repeated. It is best given in conjunction with hydrobromic acid, thus:

℞ Liq. trinitrin .....m. iv.
Acid. hydrobrom. dil.....m. xx.
Aquam .....ad ℥ss.

M. Sig.: Ter die.

Another useful drug for the symptomatic treatment of headache is cannabis indica. If given as the tincture in combination with other drugs it must be suspended in mucilage. It is therefore better to give it separately in the form of extract, of which half a grain to a grain may be made into a pill with lycopodium, and given three times daily.

Ross, in a valuable paper contributed to the *Lancet* of January 20, 1904, describes a chronic headache, which he calls the lymphatic type of headache, which shows itself as a dull, heavy ache, worse in the morning, and tending to wear off as the day advances, and is accompanied by mental and physical lassitude. This, he says, is associated with deficient coagulability of the blood, and yields readily to chloride of calcium.

In very persistent headaches which resist all treatment it is well to try the effect of a blister in the nape of the neck to be kept open with savin ointment for a week or ten days on end. I have known this expedient succeed where other measures had failed.

[11] "Goutiness," *Clinical Journal*, 1906.

BOOK REVIEWS.

CLINICAL DIAGNOSIS. By Charles Phillips Emerson, A.B., M.D. Philadelphia and London: The J. B. Lippincott Co., 1906.

The writer in his preface says that there have been so many and such excellent text-books on clinical diagnosis issued within the last few years that to cover the same ground in the same way would be unnecessary. He has aimed in the present work to cover the ground in a different way, and he believes in a manner which will commend itself to the medical profession. The work is based on the author's experience as physician-in-charge of the clinical laboratory and instructor in medicine of the Johns Hopkins Hospital and University. He has had at his disposal all the clinical records of the ward cases for the seventeen years of this hospital's activity. What is required of the students of the Johns Hopkins Hospital might well be taken as a guide by the mature practitioner. He assumes at the outset that the student has a knowledge of the normal constituents and microscopic appearances of the blood, urine, sputum, gastric contents, and feces. The object of the course is not so much to impart knowledge as to raise the efficiency of the student. It is not a course in chemistry and microscopy, but is applied to the study of a patient. Students are required to practice the best methods in every-day use, not only until they understand them but until they can accurately use them. It is the practical use of an examination which is emphasized. If approximate methods will do they are used; if accurate methods are necessary accurate work must be done whatever the cost in time. To use an approximate method well is far better than to employ a more exact but laborious one indifferently. In this volume the writer has been careful not to include untried methods, as only a small number of them will last. The introduction of new methods into text-books is often dangerous. In reference to the relation of the laboratory to clinical medicine he says that the former only exists as an aid to the latter. The clinical chemist must be first a good clinician, and secondly a chemist. Even from the laboratory point of view the stethoscope is of more importance than the microscope, and the percussion finger than a whole outfit of chemical apparatus.

The introduction is written by William Osler, and in his usual terse style he tells us that the all-important problem in medical education is to give a man the knowledge he can use, and the aim of this book is to send men into practice able to give patients the benefit of modern scientific methods in the diagnosis and treatment of disease—men who *use* the microscope, who examine sputum, and who use the stethoscope, and who can do the routine urine and blood work with confidence. The men to study a book of this kind are young practitioners who are keeping up the knowledge obtained at the medical school, and who appreciate a small laboratory as the most valuable stock in trade. As a practitioner becomes more and more engaged he can hand over to an assistant the laboratory side of the work, but it is surprising how much can be done even by the busiest of men if the will is there and if the methods have once been thoroughly mastered.

The first 80 pages of the work are devoted to a description of the sputa and the significance of various pathological findings. In staining the tubercle bacillus the writer only recommends the Ziehl-Neelsen method. So frequently have the statements been made that tubercle bacilli were abundantly or sparingly present in the sputum, together with some conclusions founded thereon, that in discussing the prognostic value of the tubercle bacillus in the sputum the author says it should be remembered that possibly many of the tubercle bacilli are not stained at all; that old foci may give off very few and young foci no bacilli, however actively they may be forming; that by the occlusion of a bronchus the focus may be shut off entirely for a time, and when expelled the sputum contain a vast number of tubercle bacilli; that they may be present one day and not again for months; that in the same specimen the organisms may be abundant in one part of the specimen and none in others; that some persons with fatal tuberculosis have no bacilli in the sputum, while in other cases the bacilli are present even before the physical signs; that in the severe cases with bronchitis the secretion of the bronchi will dilute the sputum and give the appearance of a diminution in the bacilli. The foregoing is sufficient to establish the fact that very little prognostic importance can be attached to the number of bacilli, though generally speaking large and increasing numbers mean a progressive case, while a diminution or absence speaks for an improvement.

Three hundred and twenty pages are devoted to the discussion of the urine and its examination. Then follow in order examination of the stomach contents, the feces, the blood, and various body fluids. Emphasis is throughout laid upon the clinical significance of the various reactions and microscopic findings. It is not a mere catalogue of laboratory technique.

ABSTRACTS.

THERAPEUTICS.

Value of the Bier Treatment.—

ADAMS, E. *New York Medical Journal,* vol. lxxxiv, No. 7, p. 336, Aug. 18, 1906.

The rubber bandage has in many cases superseded the knife and drainage in the treatment of various chronic conditions. In ordinary tuberculous and gonorrheal arthritis the usual treatment of rest, massage, passive motion, salicylates and iodides is very unsatisfactory. In producing passive hyperemia by Bier's method an ordinary Esmarch or Martin thin pliant rubber bandage about two inches in width should be used. If such a bandage is applied moderately tight around a limb the subcutaneous veins swell and the skin becomes red, the subcutaneous tissues edematous, and the extremity feels warmer. If there is pain it ceases almost immediately, and the stiffness in the joint gradually becomes less. The rubber bandage should not produce an uncomfortable feeling, and the hyperemia which it causes is that which is of service in the cure of the local condition. Sometimes there is difficulty in obtaining this degree of hyperemia, and it requires careful attention and some practice to apply the bandage in such a way that the arteries are not compressed, while at the same time the veins are sufficiently occluded to check the reflux of blood. In applying the treatment to the knee or elbow-joint it is easier to obtain the right degree of hyperemia by bandaging the distal part with a flannel bandage. Sometimes a heavy coating of tincture of iodine over the diseased joint causes a slight inflammation; then the bandage applied over the affected part causes a good hyperemia. The limb can be made bloodless for a few moments by Esmarch's method, and after waiting for the reactive hyperemia, then dam with the bandage.

To prevent unpleasant results from pressure at the point where the bandage is applied a few layers of gauze can be placed between it and the skin. It is advisable to change the place of the bandage, putting it at night just above the diseased joint, and during the daytime quite far away from the joint. If the constriction is too great the skin of the limb looks grayish-blue, and there appear whitish or vermilion colored spots which grow larger as the constriction is continued. The joint sometimes appears cold to the touch, and in these cases there will be pain and paresthesia. These symptoms indicate that the bandage should be loosened. At first the bandage can only be worn for half an hour in the morning and half an hour in the afternoon, then the length of time can be increased daily. In one of the writer's cases it was worn continuously for eighteen hours. The patient must be strictly admonished to at once report if more pain is felt or if the joint becomes blue or feels cold or numb. The following cases illustrate the application of this method:

Case 1.—J. W., male, 22 years of age, fireman by occupation. He was seen the early part of January of this year for the first time. Four weeks previous to this he had had a slight gonorrheal infection, and felt perfectly well until a few days ago, when he experienced severe pain in the left knee-joint, which became swollen, painful, and stiff. He was treated with salicylates without any results. The pain in the meantime became so severe that narcotics were given to produce sleep. Then the Bier treatment was applied for the

first time for half an hour in the morning and evening. The first night the patient was able to sleep without the use of any drugs. After three days the patient was able to walk with the aid of a cane, and within one month the stiffness and pain had entirely disappeared.

Case 2.—R. B., male, 39 years of age, suffered for eleven weeks with an inflammation of the right ankle-joint, with swelling, severe pain, and stiffness. He had been treated for rheumatism without any effect. Bier treatment was applied, the first application being of fifteen minutes' duration; the length of time was daily increased, and at the end of the week the patient was able to walk with the use of a cane. The bandage was now kept on for four hours in the morning and five in the afternoon. At the end of twenty-two days the patient was able to walk about all day, the pain and stiffness having entirely disappeared.

Case 3.—Girl, A. C., aged 21, single, always enjoyed the best of health. On June 17, 1904, she struck her right elbow-joint against a chair, and a few days later noticed a swelling of the joint. This gradually increased in size, being at first non-painful, but at the end of seven weeks the patient was unable to move the joint owing to the severe pain and stiffness. Bier treatment was applied, the length of time for the application of bandage being increased daily. At the end of one year flexion, extension, and pronation were perfect, while supination was not quite fully restored. There is absolutely no pain, and she can now use the arm as well as ever. She had been under treatment for over one year.

Case 4.—C. S., single female, aged 20, consulted the writer for the first time December 12, 1904, with all the cardinal symptoms of a right tuberculous ankle-joint. Bier treatment applied. At first she was able to keep the bandage on for only a half-hour in the morning and afternoon, the length of time being increased daily, so that now the bandage can be worn for eighteen hours without any inconvenience. At present there is no pain, and the patient can use the limb as well as ever.

The localized hyperemia gradually subsides even before the constriction is removed. In pus cases in which this method does not give prompt relief the pus should be evacuated. The congestion must be considerable, but not sufficiently intense to cause pain. Failures are more commonly due to faulty technique than to any imperfection in the method. Recently Bier's assistant Klapp has modified the treatment for abscess of the soft parts by the use of ordinary dry cups, which are placed directly over the abscess, the cup being sufficiently broad to go beyond the suppurating area; this treatment is applied once or twice daily for from one-half to one hour. It has been used in abscess of the breast, carbuncles, furuncles, and phlegmons of the extremities. The method is simple, alleviates pain, and cures in half the time required by other methods.

Treatment of the More Common Secondary Symptoms of Diabetes.—

CROFTAN, A. C. *Medical Fortnightly,* vol. xxx, No. 2, p. 407, July 25, 1906.

As a rule the complications of diabetes improve or disappear with a lessening of the glycosuria. Owing to these complications it is sometimes necessary to institute more rigid treatment than would otherwise be necessary. Among the most distressing of the complications are those connected with the mouth and teeth. It is important that every patient with diabetes should from the beginning be instructed carefully in regard to the possibilities of mouth complications and taught how to keep the mouth aseptic. After each meal a diabetic should rinse the mouth and cleanse the teeth, preferably with a three-per-cent solution of sodium carbonate in warm water to which may

be added as a flavor a few drops of the tincture of eucalyptus or a little menthol. Mechanical irregularities of the teeth should be corrected. Excessive fetor may be corrected by using the following mouth-wash:

℞ Beta-naphthol ..... 0.2.
Sodium biborate ..... 20.0.
Peppermint water ..... 200.0.
Distilled water .....1000.0.

If the gums are painful and bleeding use:

℞ Tincture of opium..... 2.0.
Chlorate of potash,
Biborate of soda, ää..... 10.0
Decoction of marshmallow root..1000.0

Pruritus either general or localized about the genitals is one of the earliest and most distressing symptoms. It is presumably due to irritation of the cutaneous nerves, and in most cases it improves with the lessening or disappearance of the sugar from the urine. Anodyne powders or ointments may be necessary to relieve the local irritation, or a dusting powder of 10-per-cent orthoform. This should be combined with frequent washing of the parts without rubbing or scratching. Dyspeptic symptoms in the course of diabetes call for prompt treatment, as the management of this disease depends largely upon an intact gastro-intestinal tract. Dyspeptic symptoms are not an infrequent forerunner of coma. Dyspeptic symptoms frequently result from the excessive meat and fat diet, or they may be due to the simple overloading of the stomach. In severe cases of gastric irritation it is best to withdraw food completely for a period of twenty-four hours, allowing a little broth or diluted milk. When vomiting is frequent, oxalate of cerium may be given in one-grain doses, or a small dose of cocaine. Teaspoonful doses of two-per-cent chloroform water frequently give relief, as do hot or cold applications to the epigastrium. After the stomach has rested a return to a more liberal diet should be gradual.

Catarrh of the bowel is serious in diabetes. The acute catarrh with profuse diarrhea should be treated energetically. The interference with assimilation which results rapidly weakens the patient and not infrequently precipitates coma. Bismuth, extract of opium, and tannic acid should be relied on until the diarrhea is checked. Fatty diarrhea is not uncommon, probably due to involvement of the pancreas and hepatic insufficiency. The fats in the diet should be reduced and the patient given calcium carbonate with pancreatin and ox-gall at frequent intervals.

Constipation is often a dangerous complication and not infrequently precipitates coma. It can be overcome by fat feeding, saline waters, or a lemonade made of

℞ Glycerin ..... 3 parts.
Citric acid ..... 5 parts.
Water .....1000 parts.

Rhubarb and soda mixtures are also valuable laxatives in the constipation of diabetes.

Among the more severe complications of diabetes is neuralgia, which symptomatically is best met by quinine sulphate and extract of opium. Antipyrin is also useful and exercises a favorable influence upon the glycosuria.

Gangrene is one of the most distressing and dangerous complications of diabetes. When it appears a moist boric acid dressing should be applied until after the line of demarcation forms. Then amputation is necessary, which should be performed well up where the arteries are healthy. After this complication appears the diet should never be carbohydrate-free, but 50 to 100 drachms of white bread or its equivalent should be given. In individuals with marked arterial sclerosis continuous pain, tingling, or hyperesthesia in the extremities should be a signal for the employment of hot foot-baths and massage to stimulate the return circulation. In this way gangrene may sometimes be prevented.

A Serum for Exophthalmic Goitre.—

BEEBE, S. P. *Journal of the American Medical Association*, vol. xlvii, No. 9, p. 661, Sept. 1, 1906.

The writer says that a serum having a high degree of specificity can be prepared by injecting the purified nucleoproteids of a given organ into some animal of alien species. It was proved that absolute specificity cannot be attained by this method, and, he believes, by no other. At the time of his first report Dr. Rogers and he had used only the serum obtained from the thyroids of fatal cases of exophthalmic goitre. Since then they have experimented with the serum derived from normal human glands obtained at autopsy, and the method of their preparation and obtaining the serum are detailed at length. Three species of animals—rabbits, sheep, and dogs—have been used for developing the serum, chiefly large buck Belgian hares, which were found to give the best serum. For some reason dogs were found to be not well adapted for this purpose. Experiments having shown that the agglutinating power of the serum is in a remarkable degree parallel with the local and constitutional reaction produced, a means of comparative standardization is afforded. As regards any hemolytic action of the serum, Beebe thinks it improbable with the therapeutic dose, though he admits that it is possible that it may be greater in the living body than *in vitro*. Clinically he has observed that the serum treatment causes an increase in the percentage of hemoglobin and the number of erythrocytes, possibly due to the general health improvement and not to any direct action on the blood-forming organs.

The therapeutic use of the serum is based on the theory that exophthalmic goitre is a toxemia and that the toxin in question is the thyreoglobulin. This theory best explains the striking results obtained in some acute cases with soft thyroids, probably in a state of simple hypertrophy and containing a large amount of colloid matter with but a slight increase in the number of cells. The majority of cases, however, are of the chronic type, and do not show at once this rapid improvement. The gland is more cellular, and the cytotoxic element in the serum, in the small doses given, is probably too feeble to cause immediate or rapid diminution of the gland. More rapid destruction, moreover, might be dangerous in these cases. There is some reason to think that the serum does have a cytolytic effect; the main fact is that there is a reduction in the size of the gland, and in a few cases it has been restored to apparently normal size.

There is an advantage in having two sources of the serum; in some cases treated at first effectually with sheep serum for a considerable period, it became ineffective to control the exacerbations that then occurred, but these were promptly controlled by the use of the serum from rabbits. It would seem that here the long-continued use had developed in the patient an antiantitoxin, and he was thus made largely immune. The immunity, however, evidently did not extend to the biologically different antitoxin. In cases requiring long-continued treatment an occasional change in the biologic character of the serum may be required.

Beebe does not find from his investigations and the therapeutic tests that there is any radical difference between the normal and pathologic serums. More study and testing, however, are yet required positively to settle the question, which is an extremely complex one. If the hypothesis regarding the antitoxic and cytotoxic properties and their dependence on the injection of thyreoglobulin and nucleoproteid respectively is correct, it will be advisable to vary the activity of the serum in respect to these two factors to meet the indications in different cases. Experiments are being made

as to this question, but no statement of results can as yet be given.

Considering all the facts, Beebe thinks it fair to conclude that the serum has considerable value in the medical treatment of exophthalmic goitre. The improvements and cures under its use have been too numerous to be ascribed to coincidence, and he believes that under favorable conditions much can be accomplished by careful serum therapy.

The Treatment of Chronic Infections of the Nasopharynx by Benzoyl-acetyl-peroxide.—

WARBRICK, J. C. *Buffalo Medical Journal,* vol. lxii, No. 2, p. 80, September, 1906.

A congested sensitive mucous membrane of the nasopharynx frequently results from the presence of microörganisms. A chronic congestion will lead to hypertrophy of the turbinates, deflection of the septum, and reflex irritation. What is needed in the treatment of these cases is an antiseptic that will destroy the germs but will not be harmful to the tissues. The writer has found benzoyl-acetyl-peroxide (acetozone) in aqueous solution admirably adapted for spraying the nose. He has used a solution of pure acetozone, a grain and a half to six ounces of water. Where more prolonged contact is desired the aqueous solution is substituted by dissolving the acetozone in an oily liquid. Such a preparation can now be obtained on the market under the name acetozone inhalant, which contains one per cent of acetozone and five-tenths per cent of chloretone in liquid petrolatum. It possesses the characteristic properties of acetozone, is germicidal and innocuous. In the treatment of nasal catarrh with acetozone the nasopharynx should first be cleansed with an alkaline fluid such as Dobell's solution. The writer then sprays into the nares a liberal quantity of the acetozone inhalant. The following cases illustrate the efficiency of the treatment:

Case 1.—Mrs. F. K., aged 33 years, by occupation a stenographer, was seen on January 27, 1904. She stated that she had had catarrh for ten years and that she suffered from hayfever during the season. She complained of profuse discharge from the nares and some accumulation in the nasopharynx; also of a disagreeable taste in the mouth and stomachic disturbance. She coughed in the morning, raising quite a quantity of phlegmatic expectoration. The face was sallow. In the left naris there was a small spur on the lower and anterior portion of the septum. Both nares were nearly filled with a thick serous exudate. The vocal cords were congested, as was also the pharyngeal wall. This patient received fifteen treatments, after which she was so much improved that she ceased her visits and treatments.

Case 2.—Mr. C. A. K., aged 35 years, was first seen on March 13, 1905, stating that his nose and throat had given him trouble for a long time, that there was a continual mucous discharge from the nasopharynx, and that he expectorated a great deal of "phlegm" all the time, but this was aggravated in the morning. Had tried various treatments without avail. He smoked three or four cigars daily. The nasal mucous membrane was red and congested, and there was a profuse stringy discharge accumulating on the posterior pharyngeal wall. He required ten treatments locally with the regularly prescribed régime to restore his normal condition.

Case 3.—Mrs. G. A., aged 58 years, housewife, visited the author on August 11, 1905, giving a history of having had catarrh for thirty years; an attack of ulcerative pharyngitis, for which she used a gargle, a long time ago; several attacks of bronchitis and one of pneumonia. She was always more or less hoarse and could not sing at all. She also complained of vertical and frontal headaches and

pain across the eyes, which were aggravated on rainy days. Sense of smell had been lost for a year. She had a bad taste in her mouth and her stomach was out of order; flatulency, irregular bowels, with occasional crampy pains, and a disordered liver. Previous weight, 165 pounds; at that time 137 pounds.

The nasal mucous membrane was sensitive, and there was considerable discharge from the anterior nares and an accumulation of mucus in the nasopharynx. Heart normal, liver slightly enlarged.

The patient had been treated for years without any benefit to her nose and throat. The writer gave her twenty-three treatments, both local and general, and at the time of her dismissal she was greatly improved.

Strychnine as a Remedy in Pulmonary Tuberculosis.—

MILROY, W. F. *New York Medical Journal,* vol. lxxxiv, No. 8, p. 382, Aug. 25, 1906.

The writer expresses the opinion that strychnine is of value in pulmonary tuberculosis either as an adjuvant to the open air, forced feeding, and rest, or when these cannot be obtained. Pepper ten years ago called attention to maximum doses of strychnine in the treatment of pulmonary tuberculosis. To arrive at the physiological effects he begins with the administration of 1/30 of a grain four times a day, distributing the dose as evenly as possible. At the end of each five days an additional thirtieth of a grain is added to one of the doses until 2/30 is given four times daily. Above this amount the increase should be 1/60 of a grain. The aim should be to secure the physiological limit, as shown by a certain amount of muscular rigidity, such as holding the head back, a stiffness of the jaw or in the anterior muscles of the thigh. When such symptoms appear the dose should be diminished by about one-fourth, and then increased to a point just short of that which previously produced muscular rigidity. When the disease is most active a larger quantity of the drug can be taken, and a certain amount of tolerance is established as the dose increases. One of the writer's patients weighing 120 pounds took three-fourths of a grain daily for months. As the disease subsides tolerance for the drug diminishes. The writer has used it in numerous cases and has become convinced of its value. A typical history is as follows:

A married woman, 28 years old, came to the writer's dispensary clinic in the summer of 1898 with a violent and very acute attack of phthisis. She was having hemoptysis, often several times daily; aphonia; a violent cough, with profuse and foul-smelling sputum, loaded with tubercle bacilli; severe night sweats; a temperature ranging from 101° to 104° and higher; nausea and vomiting, with inability to digest sufficient food; great prostration and loss of weight—in short, about every symptom that one is likely to meet with in a violent outbreak of this disease. Physical examination located the trouble in the upper part of the right lung. It was the author's opinion that the woman would not live two months. She lived five years, and died of pneumonia. During those years she was under observation most of the time. He was unable to secure very much modification as to her mode of living, which was not very favorable. She was placed upon strychnine and took no other medicine. Within a week she showed improvement, and by the end of two weeks her condition was materially improved in respect to every unfavorable symptom from which she suffered. When the limit of the tolerance of the drug had been reached she gained in the most gratifying manner. In her case it happened over and over again that the maximum dose having been taken for from two to four weeks she presented herself complaining of a recurrence of one of the symptoms that had

abated. The dose of the strychnine was increased to the amount that had previously produced a toxic effect, and it was found to be well borne, and even an additional amount was necessary. On each of these occasions the recrudescent symptom, whether cough, pain, hemorrhage, night sweat, or whatever it might be, soon again was relieved, thus illustrating both the establishment of tolerance for the drug and the necessity for the use of the maximum dose.

The patient in taking these augmenting doses should be taught what signs to look for, in order that the dose may be stopped when the physiological limits have been reached.

Serum Treatment of Cerebrospinal Meningitis.— FLEXNER, S. *Journal of the American Medical Association,* vol. xlvii, No. 8, p. 560, Aug. 25, 1906.

The writer has studied the exudates from sporadic cases of cerebrospinal meningitis in the Rockefeller Institute and noticed the peculiarities of the diplococcus intracellularis and its toxin, experimenting chiefly on small guinea-pigs. He also experimented on monkeys to reproduce the lesions and symptoms of cerebrospinal meningitis in man, introducing the cultures into the spinal canal by lumbar puncture, and found that the lower monkeys could be infected without great difficulty with the diplococcus, reproducing the pathologic conditions and symptoms of epidemic cerebrospinal meningitis. The cocci thus injected distributed themselves in a few hours, producing a meningitis and an exudate accumulating chiefly in the spinal meninges and the basal meninges of the brain. The uniformity of the exudate in this latter location and the rarity of its appearance in any amount over the convexity led him to doubt the validity of the reasoning which ascribed this localization in man to the entrance of this infection through the nasal membranes. Although the lesions and conditions are comparable with those in man the susceptibility of the monkey seems to be much less, and a much larger dose per kilogramme is required than what is probably effective in human infection. The proliferation of the cocci also is comparatively small in monkeys.

Flexner also experimented with antisera prepared in rabbits, goats, and large monkeys. If the experimental disease in the monkey could be checked by the lumbar inoculation of such antisera without later ill effects the possibility of a serum treatment in man is also suggested. The details of the experiments are given both on guinea-pigs and monkeys, goat serum being used and control animals being also observed in each case. In a series of five large monkeys the results of the antiserum inoculations were fairly successful in four, but one altogether unexpected failure occurred. In guinea-pigs infected by peritoneal inoculation the goat serum was protective with simultaneous injection of one cubic centimeter of antiserum, and also as a therapeutic application when given intraperitoneally two and four hours, respectively, after the inoculation. Subcutaneous injection several hours after infection failed to protect, even with larger doses of the antiserum.

He does not yet consider it safe to predict how far the results obtained with monkeys are applicable to the treatment of cerebrospinal meningitis in man, but further experiments may develop something of value. If it were practicable to employ monkeys to produce the antisera to be used in man, the danger of serum intoxication might be lessened while the good effects of the immunity principle might be retained. At present he does not think the injection of alien sera into the human spinal canal should be undertaken until their physiologic action has been worked out in more detail on monkeys. It is his intention to continue the studies already begun along these lines.

B. J. C.

Therapeutic Progress.—

REILLY, T. F. *Journal of the American Medical Association,* vol. xlvii, No. 9, p. 648, Sept. 1, 1906.

The writer in the chairman's address before the section on pharmacology and therapeutics at the last meeting of the American Medical Association reviewed the progress of therapeutics during the past year. He said that few useful remedies have been introduced; the increasing use of ethyl chloride as a preliminary anesthetic in ether anesthesia is noticed, while the claims of scopolamine-morphine anesthesia have, in a measure, he states, been discredited by experience. A considerable impetus has been given to the use of the soluble salts of mercury by hypodermic injection in the treatment of syphilis, and Reilly predicts that the use of inunctions in the treatment of this disease will soon be a thing of the past. No new organic silver salt has been launched during the past year; a few cocaine substitutes are awaiting trial, but he thinks, from personal observation, that their advantages are more than counterbalanced by their disadvantages. Creosote and its congeners seem to be losing public confidence for the treatment of pneumonia, and in the East the brilliant results from massive doses of quinine that are reported from the Southwest have not been seen. The faith in drugs for pneumonia has not generally increased; strychnine, he says, is the only agent used with any constancy in the large metropolitan hospitals. The tendency to seek animal remedies has increased, and in this connection he notices the Möbius and the Beebe and Rogers serums as promising to be of value. There has been little added to our knowledge of the therapeutic properties of the extract of suprarenal, but there have been some warnings of the dangers of hypodermic use of its various preparations, and its possible effects on the arterial walls must be kept in mind in its continued use on human beings. The number of diseases considered benefited by *x*-ray therapy has been reduced rather than enlarged by the later experience. The use of large doses of diphtheria antitoxin in diphtheria is increasing. Its value in postdiphtheric paralysis has been confirmed, and while the intravenous use of this agent has not had much favor it may be worthy of trial in some cases. Reilly does not speak favorably of its utility outside of diphtheria. The prophylactic value of antitetanic serum is confirmed; it may be regarded as a specific. There is some reason to think that polyvalent sera can also be of prophylactic value in suitable conditions. No confirmation of Behring's antituberculous sera has been reported.

Treatment of Emaciation.—

BREISACHER, L. *Journal of the American Medical Association,* vol. xlvii, No. 8, p. 558, Aug. 25, 1906.

Leanness may be due to various causes. It is sometimes apparently hereditary, but may arise as a primary or secondary condition. The one great cause, excluding certain emaciating chronic diseases, is insufficient amount of food, which may be due to loss of appetite from physical or mental causes, or the result of faulty dietetic habits which are sometimes handed down in families from generation to generation. Frequently it results from an ignorance of the nutritive significance of particular foods, or is the effect of eating but one or two meals a day in persons not fitted for such a regimen. It may be due to poverty or nervousness, sexual neurasthenia or hysteria. These latter predominated, together with digestive abnormalities, in the majority of his cases, and he has also observed attendant arteriosclerosis and insomnia, which are given by Cabot as causes, in a number of his cases. To a second group of causes belong the gastrointestinal disorders, mechanical or secretory, which he observed in nearly all his patients. He thinks there is no doubt that the foundation of these disorders

is often laid in the artificial feeding of infants. He also mentions the improper metabolism of food and increased oxygenation in the blood, which cannot be precisely defined.

In the treatment, therefore, it is advisable to make thorough examinations for all possible conditions, and to ascertain to what degree the stomach and bowels will bear forced feeding and what food will be best taken, digested, and absorbed. With these points determined he maps out a diet list containing from 2200 to 2500 calories, and gradually increases this to from 3800 to 4500 calories. This extreme diet is divided by him into 250 grains of fat, 150 of albumin, and 400 of carbohydrates, amounting altogether to 4580 calories. He also gives tonics, and pushes them to the physiologic limits if necessary. In nervous individuals he uses nerve sedatives, but never narcotics. From time to time he notices the excretory activity of the kidneys and compares it with the water intake, which should be from 2000 to 3000 cubic centimeters. Exercise is lessened or increased according to the demands of the case, and Breisacher also uses tepid baths, cold rubs, massage, and electricity. Under this treatment patients often gain very rapidly in weight, calling sometimes for reduction in diet. The chronic underfed usually require from two to six months' careful treatment of this kind.

Therapeutic Value of Ergot.—

OSBORNE, O. T. *New York Medical Journal*, vol. lxxxiv, No. 2, p. 53, July 14, 1906.

After referring to the pharmacology of ergot, the writer says that its therapeutic virtues reside in the extract. The preparations ergone and aseptic ergot are very active and non-irritating, and can be used hypodermically without causing ergotism. The principal uses of ergot are as a nervous sedative, as a circulatory tonic, as a smooth muscle stimulant, and as a uterine contractor. Its physiological action is upon the blood-vessels, diminishing the amount of blood in the central nervous system by contracting the blood-vessels of the brain and spinal cord. It increases intestinal activity, and if it is pushed it may cause vasomotor tension and embarrassment of the left side of the heart. Ergot is one of the best remedies at our command to stimulate the heart in cases of shock, collapse, and circulatory depression. The best results are obtained from its administration hypodermically, and its advantages are unquestioned in cases of cardiac failure. Of course, in cases of cardiac disease in which there is an increase of peripheral resistance it should not be used, as it throws additional work on a failing heart muscle. It is only useful in acute circulatory failure where the trouble is with the vessels. The drug cannot be too highly lauded in cases of cerebrospinal meningitis. In conditions of nerve pain very much less morphine is required if ergot is also given. It is useful in neuritis and referred pains, and in psychic or hysterical pain. It is especially useful in failure of persistalsis after surgical operations. Its use in uterine hemorrhage is too well known to require comment. Its value in asthmatic attacks is unquestioned, giving more relief than bromides or morphine. There are two types of asthmatic attacks, in one of which nitroglycerin will give the most relief, and another type in which suprarenal in some form is of use. Where there is more or less persistent wheezing or frequently recurring night attacks ergot is of the most benefit. In cerebral irritability and inflammation as well as in the drug habits ergot is very valuable, and it frequently calms the cerebral excitement of delirium tremens and other forms of acute alcoholism. Attention is called to its use in diabetes insipidus, the writer having relieved a severe case of this affection by the persistent use of ergot extending over a period of about eighteen months, during which time there were no symptoms of ergotism.

Treatment of Fractured Ribs.—

WOODWARD, R. M. *Journal of the Association of Military Surgeons,* vol. xix, No. 3, p. 257, September, 1906.

The writer is encouraged to touch upon this well-worn subject by the fact that many patients admitted to hospital with fractured ribs had pieces of adhesive plaster of almost any size and shape directly over the seat of fracture. Some were admitted dressed with one piece of plaster three by eight inches. The main object in strapping the chest, as in all fractures, is to immobilize the fragments, in so far as is consistent with normal respiration. To accomplish this the plaster must have an excellent adhesive quality, must be applied with some tension, and must reach from the midline in front to the midline behind. It must be applied well above and below the seat of fracture. The plaster must be covered by a protective dressing to assist in holding it in place. To apply the plaster properly the skin should be first scrubbed with alcohol or ether. The strips should be commonly about two inches wide, but in the very obese it may be better to have them somewhat wider. The strips should be cut so that they reach beyond the midline behind and in front. The first strip of plaster in fractures from the fifth to the ninth rib, where they usually occur, and in the midaxillary line is applied parallel to the ribs from in front backward and upward, and is placed well below the point of fracture. The front end is attached first, and then while making considerable tension upon the strip it is carefully and smoothly applied upward and backward to a point just beyond the spine. The second strip is attached in front at a point level with the nipple, and is passed downward and backward to a point in the lumbar region. The third strip follows the direction of the first, overlapping its upper half, the fourth overlaps the second, etc. The line of overlapping should fall directly over the seat of the fracture. When completed the chest should be strapped from a point slightly above the ilium to a point well into the axilla. A four-inch gauze bandage should then be evenly applied over the entire chest and abdomen, and over that a starch bandage. To prevent the jacket after it is applied from slipping down shoulder-straps may be attached by safety-pins. Such a dressing may be worn from three to four weeks.

Ethyl Chloride as a General Anesthetic.—

HAWLEY, G. F. *Journal of the American Medical Association,* vol. xlvii, No. 7, p. 502, Aug. 18, 1906.

Diametrically opposite opinions are held as to the value and safety of this anesthetic. The writer states that after several years of more or less constant use of ethyl chloride both in clinical and in private practice, he has still to see the first case to cause him the slightest fear or uneasiness. He declares that when used with care and understanding he prefers ethyl chloride to any other anesthetic, in short operations, except, perhaps, nitrous oxide gas. He states that the following precautions should be observed: (1) The patient should be prepared as for chloroform or ether; (2) whatever mask is used it should fit the face snugly; (3) a graduated tube with a large aperture should be used; (4) the anesthetic should be well supplied with air and as little given as possible; (5) care should be taken not to present it at first in too large a quantity, frequently a drachm is sufficient for short operations; (6) the patient should rest a while after its administration, as faintness sometimes supervenes; (7) a mask should be used which does not receive the drug close to the patient's face, otherwise one is liable either to freeze the face of the patient or to cause asphyxia by the moisture from the expired air freezing on the gauze in the mask and thus preventing the free passage of air to the patient.

The Care of Far-advanced Cases of Pulmonary Tuberculosis.—

BONNEY, S. G. *Boston Medical and Surgical Journal,* vol. clv, No. 9, p. 222, Aug. 30, 1906.

The writer in a carefully prepared paper read before the American Climatological Association in May, 1906, directs attention to the attitude of the physician in assuming the direction of patients suffering from far-advanced pulmonary tuberculosis. He emphasizes the importance of patient observation and detailed management in the treatment of such cases, especially fresh air and rest, together with the management of the diet and of fever, the latter to be met largely by the use of antistreptococcic serum, which he has found useful in selected cases. About one case in four or five will exhibit a pronounced diminution of temperature in about a week or ten days under its use. The remaining cases do not show any bad results from its employment other than that due to the occasional intolerance of horse serum. The so-called reaction, which may occur promptly or may be delayed, is not essential to the curative action of the serum, though in some cases improvement may not be noted until after a reaction takes place. The use of the serum is usually followed by a subsidence in the temperature. He is not in favor of employing the serum continuously, but gives not to exceed four or five doses at intervals of one or two days, and then awaits results.

Artificial Localized Hyperemia in the Treatment of Ambulatory Cases.—

BEER, E. *Medical Record,* vol. lxx, No. 8, p. 283, Aug. 25, 1906.

The writer believes that localized hyperemia is a most important therapeutic measure. Hyperemia is of two kinds, active or arterial, and passive or venous. The two methods employed by the writer are the suction and the constriction methods. Suction hyperemia is brought about by cupping the part to be treated. During this procedure no pain should be caused and the suction should be intermittent. By this process an early separation of dead from living tissues is effected, with discharge of all pus and sloughs. The ninety-odd cases treated by the author in this way include the following conditions and diseases: Prevention against infection in incised and perforating wounds of the extremities, infected wounds and cellulitis of fingers or hand, abscesses, furuncles, carbuncles, acute suppurative adenitis, acute bursitis, contusions, and more chronic conditions. Many of the cases in which constriction hyperemia was used were chronic. Excellent results have been obtained by this method in the case of tuberculous bones and joints. It has also been employed in a variety of superficial conditions and in neuralgias. Artificially produced edema has an analgesic action as well as antibacterial. There is also a nutritive and a resorptive influence inherent in this process.

Diet in Tuberculosis.—

KING, H. N. *Medical Record,* vol. lxx, No. 3, p. 88, July 21, 1906.

Emphasis is laid upon the disturbed metabolism in the development of tuberculosis. If the cell is normally nourished it will resist the invasion of the tubercle bacillus indefinitely. In cases of tuberculosis the errors in nutrition can be traced to a period determining by months and often years the probable period of infection. The diet question in the tuberculous is more than a calculation of the calories. It cannot be solved by a theoretical standard of proteids, fats, and carbohydrates. The tastes, habits, and peculiarities of patients and their heredity are important factors. Variety in preparation and in the manner of serving foods is most important. Psychotherapy is not to be neglected in the diet prescriptions of these patients. The amount of food required should be given, but overfeeding should be avoided.

Leukemia Successfully Treated with Arsenic.—

DICKSON, F. L. *Lancet,* vol. clxxi, No. 7 of vol. ii, p. 439, Aug. 18, 1906.

The patient was taken with some indefinite symptoms, pain in the back, slight headache, and general debility. The temperature was slightly raised. The debility apparently followed an influenza, for which hypophosphites and cod-liver oil were prescribed. At the time it was noted that there was a slight swelling of one of the deep cervical glands. It was hard, freely movable, and quite painless. An examination of the blood showed a great excess of leucocytes and lymphocytes, the latter predominating. The administration of liquor arsenicalis in full doses three times a day was begun, and after three days the patient felt much better and the blood count was improved. The dose of liquor arsenicalis was increased rapidly until 15 minims was being taken thrice daily. The improvement continued, and no toxic symptoms developed. A fortnight after beginning treatment the glands had subsided to a normal condition. A later examination of the blood showed it to be practically normal. In all the treatment extended over a month.

Tuberculin in the Treatment of Tuberculosis.—

POGUE, G. R. *Medical Record,* vol. lxx, No. 5, p. 169, Aug. 4, 1906.

This discussion of the use of tuberculin in tuberculosis is based upon 167 cases. Like other writers the importance of an early diagnosis is emphasized. If treatment is begun early there is some certainty that the disease will be arrested, and tuberculin is a valuable adjuvant in the treatment. In 28 out of 30 cases that were treated with practically nothing but tuberculin, while they continued to follow their ordinary occupations during the treatment, there was recovery. Cases treated with tuberculin show less tendency to recur than do cases without it. Tuberculin in small doses, .01 to .5 milligramme, seems to have a more curative action than when given in large and increasing doses. No ill effects follow the administration of small doses of tuberculin, and incipient cases improve rapidly under its use. Tuberculin should never be given to a patient who is suffering from a mixed infection. Advanced cases receive little or no benefit from tuberculin.

THERAPEUTIC BREVITIES.

Air Dilatation in Chronic Constipation.—

L. J. Hirschman (*Medical Record,* Aug. 11, 1906) believes that the direct stimulation of the atonic sigmoid and rectum by means of mechanical dilatation has up to the present time given the best results in cases of chronic constipation. The writer describes his simple pneumatic dilator for accomplishing this distention. It consists of a rubber bag with a stem, which is slipped over the distal end of a Wales bougie, No. 3-5, this bougie being canalled. Compressed air at a low pressure is allowed to enter the bag slowly, and distention to any desired extent is produced. A cut-off valve easily regulates the distention. Instead of the compressed air apparatus an ordinary atomizer bulb or a small bicycle pump may be used. The patient is placed in the Sims position for the treatment. This is repeated daily for from five days to a week. When defecation approaches the normal treatments are given on alternate days. The interval is gradually lengthened. The writer has had marked success from this method of treatment.

Surgical Intervention in Nephritis.—

Alberto Rovighi (*International Clinics,* vol. ii, 1906) gives a résumé of certain experiments upon artificially induced nephritis by the administration of cantharides in animals, and studies the literature that has been accumulated regarding operation in this disease. He

says that decortication of the kidneys should be performed: (*a*) in cases of acute nephritis; (*b*) in cases in which anuria and subsequently uremia supervene in the course of chronic nephritis; (*c*) in cases in which the patients are still young and robust and there is imminent danger of losing life, and (*d*) in which medical measures have been used without success. The operation holds out at least a hope of saving patients from an otherwise unavoidable death.

MEDICINE.

Heart Disease Without Murmur.—

SMITH, F. J. *Clinical Journal*, vol. xxviii, No. 14, p. 209, July 18, 1906.

In a clinical lecture the writer discusses this somewhat vague and yet withal important group from the standpoint of diagnosis. His study is based on recorded histories of 100 cases, in which the diagnosis of diseases of the heart without murmur was made. Naturally the symptoms varied, running all the way from cases which died suddenly to varying degrees of shortness of the breath up to mere palpitation of the heart. Pathologically they represented every degree of degeneration, from more or less complete fatty changes to neurasthenia of a vague sort. Attention is called to the distinguishing characteristics of these cases. Not only is there no murmur, but there is no history of rheumatism or chorea, alcoholism or syphilis. Cases of cardiac involvement without murmur are often more dangerous than those with gross valvular lesions.

The diagnosis of these conditions depends on many factors, some of which lead at once to the heart, which is only secondarily affected, as in cases of emphysema and bronchitis with failing heart. Chronic renal trouble, when the hypertrophy induced by that condition has reached its limit and the big heart has begun to find that its work is too much for its capacity, often makes it difficult to discriminate between the effects of the renal trouble and those of the heart. A careful examination of the urine will clear up many of these cases. A third group is associated with the specific fevers, more especially typhoid and influenza. Such cases are not difficult of identification—the patients which come complaining of a shortness of breath, or pain in the chest or palpitation, eczema, obesity, insomnia, fainting attacks, or the conscious possession of a heart. In these cases the heart in its intrinsic mechanism of muscle and nerve is at fault. It is in these cases that the prognosis of the medical man is most often refuted, some cases dying suddenly and early from heart failure, while others may live for years. It is most important to recognize that heart disease without a murmur is a formidable condition. If the symptoms suggest cardiac derangement it is only a false security into which the physician is lured by the fact that there are no murmurs. The apex beat is by no means a safe criterion, as a pulsation which may be mistaken for it can be produced by different parts of the heart other than the apex of the left ventricle. In palpating the apex beat the whole hand should be placed on the chest, and in this way it is possible to appreciate a large heart working away under a covering of emphysematous lung. Percussion can be practiced, but its results are open to a good deal of criticism, and it is often trying to the patient. In using the stethoscope it should be employed for some time. The observer should listen to the heart for at least twenty seconds, and in suspicious cases much longer. Auscultation should be employed standing, sitting, and lying, and before and after walking or trotting several times up and down the consulting-room. By taking such an amount of care one can generally say that

a heart quickens too much under exertion or does not slow down properly with rest. An observed irregularity may become more accentuated than it ought to do under strain. In listening to the heart the actual frequency of the beats and their variations are to be carefully observed. The rhythm, a difficult thing to define, must be carefully studied. Any gross irregularity is to be noted, or the occasional, perhaps regular, dropping of a beat. There is some intangible character in the sounds themselves which is difficult to define, as is an exact appreciation of the pauses between the beats. In contrasting the two sounds the old "lub dup" is the best guide, and the more this distinction between the two sounds is diminished, the greater must be the suspicion. The actual bulk of sound, and by this is meant not simple audibility, for a whispered word is often quite as audible as a spoken one, must be estimated. It is easy to distinguish the long "lub" of a healthy, big heart acting behind a screen of lung from the first sound produced by a weak heart which is being overstrained, provided one makes a practice of thinking of such things.

The prognosis of intrinsic degeneration of the nervomuscular structure of the heart is grave, but it is not to be considered as hopeless. Following diphtheria, typhoid, and influenza in the young and middle-aged there may be complete recovery. When, however, the condition is met with in advanced age and without an obvious cause, there is little chance of restoration. In those past 45 the prognosis is very grave.

In cases in which the heart is secondarily affected the most important indication is for abstraction of blood. In these the heart muscle is sound, and where the immediate excess of strain has been removed the organ will resume its natural function. Where the nerve or muscle or both are weak any little extra strain is very dangerous. Ten of the writer's 100 cases died suddenly. It is most important in these cases to teach the patients to avoid any sudden strain or exertion. In the more acute cases, those which follow typhoid and diphtheria, the patient should be kept in bed until the pulse is only increased by about 20 beats from the prone to the standing position. If the pulse-beat much exceeds this, there should be a further period of rest. On theoretical grounds digitalis should be contraindicated when there is any fatty or fibrous degeneration, but it is of benefit given in very small doses—3 or 4 minims of the tincture, 1 to 1½ drachms of the infusion, or better still, one grain of the powdered leaves. The iodides are the most useful in these conditions in small doses, and in cases of idiosyncrasy the quantity may be reduced to one-half grain. In the question of treatment the age of the patient must be carefully considered. In the small child with disease of the heart without murmur, the prognosis is invariably grave. In adults up to 35 or 40 the condition rarely occurs without some fairly obvious cause. Excessive smoking furnishes fine examples of cardiac disturbances without murmur. Alcohol in excess may produce heart trouble. Syphilis may furnish a solution of the diagnostic puzzle and indicate the necessary treatment.

What Has Been Accomplished in the Treatment of Summer Diarrhea of Children?—

HARRIS, W. L. *Archives of Pediatrics,* 23d year. No. 7, p. 520, July, 1906.

From the time of Benjamin Rush down to the middle of the nineteenth century the summer diarrheas of infants were called cholera infantum. Renewed interest was added to the subject by the discovery of Flexner that the bacillus of Shiga was responsible for the summer diarrheas of children. The search for a specific serum has not been rewarded. Statis-

tics as to the prevalence of this disease are not yet obtainable, but there has certainly been a great improvement in the treatment of these conditions. Cases that are treated early recover promptly, but some are serious from the outset, and neglected cases soon pass into an intractable form. It is this variability that makes it practically impossible to give statistics of the disease. If all the simple cases are included, and those with a high mortality, it gives a very incorrect idea of the seriousness of summer diarrhea. The mortality of all the cases is about 15 per cent, but in the more serious types of the disease the mortality runs as high as 40 or 50 per cent. Any set of statistics therefore depends on the proportion of mild and severe cases among them, as to whether they had or had not a high mortality.

The question of nutrition is paramount in this disease. The best substitute food is a dextrinized gruel of either rice, barley, or wheat. This may ferment in the stomach but does not putrefy, and the child can take a sufficient quantity to satisfy him without doing harm. Broths may help in an emergency, but they cannot be given in sufficient quantity to do much good. Beef juice likewise can be given in only small quantities. Albumin water was formerly much used, but it is now not so generally employed. It decomposes and putrefies, and is not digested or absorbed in the intestines. The most benefit will be obtained from prophylactic measures, as the disease is to a large extent preventable. It is probable that the bacillus dysenteriæ obtains entrance to the alimentary tract through the milk or water, but it is also probable that there are always in the intestinal tract microörganisms which are capable of doing great harm in the badly fed and poorly nourished. Maternal nursing is by far the best means of feeding children, and even if the milk is scanty it should be helped out by some artificial food. Every child should be weighed at birth, and a food that the child can digest and assimilate should be chosen. If there are signs of indigestion careful notes should be made of what is wrong, and if there is not a gain of weight it is certain that the child is not receiving sufficient food, or it has one that it cannot properly digest or assimilate. A loss or no gain in weight after the first week should demand immediate attention. Delay means impairment of the digestive tract and the passage of a simple case into one more confirmed, which it may take months to overcome. Fresh, clean milk should be insisted on in substitute feeding, but good care and attention are equally important. Mothers should be instructed to watch children closely at the approach of hot weather, and if there are signs of indigestion milk should be stopped at once and a purgative given, the child in the meantime being fed on barley or rice water until the physician can be reached. An effort should be made to teach the laity that a diarrhea in summer is a serious condition and is not to be attributed to teething.

In closing the writer ventures the statement that if every physician realized the importance of what can be done toward preventing this disease and would take the trouble in every case that comes under his care to put his knowledge into practice, the mortality from this disorder would be reduced one-half within a few years.

The Origin and Significance of Casts in the Urine.—

Warfield, L. M. *St. Louis Medical Review,* vol. liv, No. 4, p. 73, July 28, 1906.

The writer discusses the views that have been held regarding the origin of casts since the days when Henle first discovered what he thought were fibrin cylinders in the urine. In acute nephritis every variety of cast is found except the hyaline. The latter indicates a chronic degenerative process going on in the

epithelium of the convoluted tubules. The epithelium regenerates rapidly, but the constant irritation leads to a stimulation of the connective tissue and an infiltration with cells resembling plasma cells. This gradually restricts the secreting area. In subacute nephritis hyaline casts are almost exclusively found, with an occasional finely granular cast. In acute exacerbations of subacute nephritis every variety of cast may be found, including the hyaline. The acute nephritis which occurs in the infectious disorders cannot as a rule be differentiated from that of a primary nephritis, except that epithelial casts in large numbers are found. When the fever ceases the epithelium regenerates and the kidney returns to its normal state. In chronic interstitial nephritis there are hyaline and finely granular casts. In the chronic parenchymatous nephritis the casts are epithelial, granular, and fatty, and often hyaline; in the large white kidney especially there is more intact epithelium, hence more epithelial casts. The kidney of chronic passive congestion and the kidney of arteriosclerosis show mostly hyaline casts. When the statement is made that certain kinds of casts occur in connection with acute, subacute, or chronic nephritis, it is meant that such usually are found, but the exceptions are many. The epithelial, granular, hyaline, and waxy casts have a common origin in the epithelial cells of the tubules. The epithelial cells may be found in large numbers in the simple catarrhal inflammations. They may occur in large numbers for a day or two and never be found again. Even large numbers of such casts occurring alone would have practically no significance provided that the occurrence was transient and that the patient's vascular system showed no evidence of disease.

The appearance of the coarsely granular cast means that there has been not only changes in the epithelium, but a degeneration of the cells. These casts usually mean some acute process in the kidney parenchyma. Rarely, if ever, do these casts occur in chronic subacute nephritis except the parenchymatous. The finely granular cast has a more serious meaning. It is rare to find these without at the same time finding hyaline casts, and the two should be considered together. The occurrence of hyaline casts in men over 50 years of age associated with some albumin generally indicates arteriosclerosis and hypertension. Waxy casts indicate considerable damage to the kidney; as a rule they are only hyaline casts which have remained for a long time in the tubules, and are usually associated with hyaline casts. Blood and pus casts indicate a severe acute disease. Fatty casts are most frequently found in malarial nephritis, although they are found in chronic parenchymatous nephritis. No opinion can be passed on the examination microscopically and chemically of one specimen of urine. A kidney may be the seat of a slow, chronic process; the hyaline casts may be few in number, and there may be days when after the most careful search none are seen. Frequent examinations are indispensable.

Occult Hemorrhages in Typhoid Fever.—

TILESTON, W. *Boston Medical and Surgical Journal*, vol. clv, No. 2, p. 30, July 12, 1906.

Clinical Examination of the Feces.—

STEELE, J. D. *University of Pennsylvania Medical Bulletin*, vol. xix, No. 5, p. 109, July, 1906.

Tileston gives the results of his study of 68 consecutive cases of typhoid in reference to the appearance of blood in the stools. In 18 a positive reaction was found. In making the tests about 5 cubic centimeters of liquid feces is taken, or if the stool is solid a piece the size of the end of the thumb is mixed with enough water to render it semifluid. The fat is first extracted with 20 cubic centimeters of ether. To the residue is then added one-third to one-

half its volume of glacial acetic acid. The two are thoroughly mixed and allowed to stand five minutes. The next step is to extract with 8 or 10 cubic centimeters of ether for fifteen minutes. The ethereal extract is divided into two equal portions, one for the guaiac and the other for the aloin test. For the first a few grains of powdered resin of guaiac are added, and then 20 drops of old oil of turpentine. The mixture is well shaken. A positive test is indicated by the appearance of a blue or violet color within fifteen minutes. Colors ranging from purple to pure blue are to be looked upon as positive, all others as negative. In applying the aloin test a fresh solution should be used. A small quantity of aloin on a knife point is dissolved in a test-tube of 70-per-cent alcohol. Of this solution 2 or 3 cubic centimeters is added to the ethereal extract, and then 20 drops of old oil of turpentine. If positive a color varying from rose to cherry-red should appear within fifteen minutes. Only those cases are considered positive which give reactions with both guaiac and aloin. The frequency of the reaction was found to vary with the severity of the disease and also its duration. The largest number of reactions were obtained in the fourth week, while in the first week there were none. As a result of his study of the literature the writer comes to the conclusion that occult hemorrhages may be detected by the guaiac and aloin tests in about 25 per cent of all cases of typhoid fever. These tests are of little value as a means of foretelling gross hemorrhages. The test is of very little value in diagnosis, owing to the inconstancy and comparatively late appearance of positive reactions.

Steele made a report in July, 1905, on this subject, since which he has studied 30 additional cases more or less systematically. In all he has made 239 observations upon 49 cases. He found occult bleeding 32 times in 239 stools tested in the 49 cases. The number of patients showing positive tests was 15, or 29.5 per cent. The occult bleeding was found to be quite as frequent in the mild as it was in the severe cases. The value of the detection of occult bleeding seems to lie in the possibility of foretelling visible hemorrhage. In his experience these slight hemorrhages do not precede visible hemorrhage with sufficient regularity to make the test of much practical value. On the other hand visible hemorrhage does not always follow occult bleeding. In a general way the occult bleeding indicates the cases in which visible hemorrhage is most likely to occur.

Spirochaeta Pallida and Syphilis.—

MARTZINOWSKI, E. I. *Meditzinskoje Obozrenie,* vol. lxv, p. 584; No. 9, 1906.

The author has investigated ten cases of recent syphilis. In one of undoubted syphilis he failed to find any spirochætæ, while in the others he found them, five times in the blood from the papules, once in a pustule, and seven times in the primary sores. Spirochæta refringens was found once on the surface of a primary ulcer. The preparations were stained by Giemsa's method modified by Schaudinn, with uniformly good results. Several times he has observed the spirochætæ in the living state, their movements being peculiar and resembling somewhat spirochæta obermeieri. The spirochætæ observed by the author were from five to twenty in number, and were identical with those described by Schaudinn and others. At times long individuals were seen which suggested the possibility of transverse division; a few were seen in masses. In one case of gummatous ulcer investigation failed to reveal the parasite. Control experiments showed that spirochætæ in general are disseminated in nature and may be found in various tissues and fluids of the human body. Thus

the author demonstrated various spirochætæ in noma, stomatitis, balanitis, vulvovaginitis, sputum, and urine. Only spirochæta avium and spirochæta refringens may be mistaken for spirochæta pallida. Those found in the sputum differed from the parasite of syphilis by being somewhat thicker. The spirochætæ found in urine could not be distinguished from spirochæta pallida. This urine was obtained from a 10-year-old girl suffering from scarlatinal nephritis without the slightest indications of syphilis. From these observations the author concludes that it is quite possible to make a mistake in the bacteriologic diagnosis of syphilis, and suggests that the finding of spirochæta pallida in gummata by other observers may have been an error.

Generalized Blastomycosis.—

CHRISTENSEN, C., and HEKTOEN, L. *Journal of the American Medical Association,* vol. xlvii, No. 4, July 28, 1906.

A detailed history of two cases of disseminated blastomycosis is given. In both the onset was sudden, and without the presence of any chronic external lesion that might be regarded as the primary localization. In the first case the cutaneous and subcutaneous lesions developed simultaneously after an acute febrile attack, and suggest the lungs as a portal of entry of the infection. In the second case the localization of the infection seems to have been in the deeper tissues before the subcutaneous invasion. The authors suggest the advisability of experiments to determine whether the organisms are easily conveyed by air currents when dry, if they retain their vitality after drying, and whether or not they are carried in minute droplets of sputum. The peculiar predilection for the skin probably indicates an important avenue of escape for the germs, it may be to new hosts. The authors suggest a possibility of infection by skin lesions by way of the blood current, and not always, as seems to have been supposed, by direct implantation from without. No effective treatment has yet been devised.

Is Neuralgia a Functional Disease?—

GORDON, A. *New York Medical Journal,* vol. lxxxiv, No. 3, p. 109, July 21, 1906.

The writer discusses the identity of neuralgia and neuritis based upon findings in eight cases of neuralgia of the fifth pair of nerves. Degeneration of the peripheral nerve is frequent if not constant in neuralgia. This nerve degeneration is probably a primary condition, which like a neuritis assumes an ascending course and involves secondarily the Gasserian ganglion. The blood-vessels play an important rôle in the causation of degeneration of the peripheral nerves. It is difficult if not impossible to draw a sharp distinction between neuritis and neuralgia, as accumulated facts show an anatomical basis in the latter affection. It is important to remove surgically a neuralgic nerve as early as possible, if after a short trial of medical treatment no results are obtained.

Cerebral Complications Secondary to Nasal Disease.—

CRAIG, R. H. *Montreal Medical Journal,* vol. xxxv, No. 8, p. 529, August, 1906.

The writer concludes that in all cases of inflammation of the meninges the nose and nasopharynx should be carefully examined. The same careful investigation should be made in all cases of obscure headache and dizziness, whether the latter is associated with aural disease or not. There is an unquestioned relation between inflammations having their origin in the nose and nasopharynx and those which involve the accessory sinus, to disease of the brain, the clinical relations of which need more exact study.

SURGERY.

A Modified Operation for Movable Kidney.—

DA COSTA, J. C. *New York Medical Journal*, vol. lxxxiv, No. 5, p. 29, Aug. 4, 1906.

In discussing the advisability of operation, the writer says it should not be undertaken unless there are symptoms of a local sort. Hysteria or neurotic conditions associated with trivial mobility, and those associated with a general splanchnoptosis, are better treated by a corset, among the best of which is Gallant's. If the kidney is so movable that it can be displaced sufficiently to bring the fingers together above the kidney, or it has reached the third degree of mobility in which it is dislocated as far as the pelvic brim, operation is indicated. To prevent damage to the kidney from kinking of the ureter such an operation should be performed whether there are symptoms or not. Any operation for fixation of the kidney should restore it to its normal position. The writer has long been dissatisfied with stitches passed through the kidney substance. Stitches through the capsule alone are better, but often yield, and the kidney again becomes dislocated, as the kidney is unsupported below. Even when a sutured kidney does not get loose the operation is unsatisfactory, as the organ is left lower than its normal position. The fixing of the sutures also rotates the kidney somewhat, so that its internal border, instead of being directed a little forward and inward, is turned too much forward.

The writer has modified the Senn method of gauze packing, which is open to numerous objections. The removal of the gauze is so painful that it requires an anesthetic. He has attempted to use rubber tissue instead of the gauze, but the granulations were scanty and the kidney tended to become loose again. He has lately used the following technique: The incision is slightly oblique, so as to admit of the removal of the appendix should that be needed. The exposure of the kidney is identical with the Senn method, and the kidney is brought out into the wound. The fatty capsule is cut away, and the fibrous capsule scraped with a needle and thoroughly rubbed with gauze, and in some cases partially or completely decapsulated. The iodoform gauze has been previously prepared in the form of two slings sutured together by plain catgut, one for each pole of the kidney. If operating on the right kidney the suture line of each piece of gauze is to be on the external surface. When the kidney is restored to its position, this means that the suture line will be on the anterior surface. After the two pieces of gauze have been placed around the kidney that organ is restored to its place and is pushed into its normal position. To prevent its subsequent descent a large piece of iodoform gauze is packed below the lower pole so as to fill up this dead space and stimulate granulations. Another and a smaller piece is pushed down on the posterior surface and sides of the kidney; the protruding ends around the upper pole are tied together with a piece of silk. The ends of the gauze from around the lower pole are also tied together, and a bit of gauze on the posterior surface of the kidney and the four ends of the gauze are tied into one bunch with a piece of silk. The ends of all the pieces of gauze emerge a little way from the wound. They are identified with ease. Two double pieces and two single pieces of gauze are used, making four in all. When it is necessary to remove the gauze two pieces are taken from around the upper pole, two pieces from around the lower pole, one piece from the posterior surface and sides of the kidney, and one piece from below the kidney. After the kidney has been raised to its position, and the gauze inserted, the wound is partially closed by sutures and the usual dressing applied. At the end of seven or eight

days the gauze is softened by warm salt solution for half an hour, which usually completely loosens it. The first piece of gauze to be removed is that packed down on the posterior surface of the kidney, then come the two pieces from around the upper, then the two from around the lower pole, and finally the large piece from below the kidney. The wound is found to be filled with granulations, and it contracts to a comparatively small size as soon as the gauze is removed. The wound is drained by a small piece of gauze, secondary sutures inserted, and usually by the seventeenth or eighteenth day the wound is healed.

Appendicostomy.—

TUTTLE, J. P. *Journal of the American Medical Association,* vol. xlvii, No. 6, p. 426, Aug. 11, 1906.

Appendicostomy is a term applied to the operation attaching the appendix to the skin for the purpose of using its lumen for the treatment of the colon. In the modified technique, instead of fastening the tip of the appendix in the cutaneous wound, as was originally done by Weir, the appendix is stripped of its mesentery down to its junction with the cecum; the latter is then attached to the parietal peritoneum; the appendix having been brought out is fastened in the lower angle of the skin wound, which is brought together by plain catgut sutures. The protruding appendix is wrapped with gutta-percha tissue, and the abdominal wound sealed with collodion or gutta-percha tissue and chloroform. At the end of two days the dressing around the appendix is removed, and if found gangrenous at the tip, as is often the case, it should be cut off at from one-fourth to three-eighths of an inch from the skin. A properly adjusted catheter is then inserted after ascertaining the patency of the appendix and dilating it as required, and a ligature tied around the stump, flush with the skin. This prevents leakage around the catheter and cuts off the stump. The catheter should be inserted from two to four inches, according to the thickness of the abdominal wall, and should protrude three to four inches. If there are no gases to escape it should be bent on itself and fastened with a safety-pin to prevent leakage on the dressings. On the third or fourth day irrigation can be begun, using warm saline solutions till the bowels are freely opened. After this the temperature of the solution should be reduced in dysenteric cases to about 65° or 75° F.

The caput coli should be located a day or two before the operation and the incision made directly over it, so that the appendix when brought out will form a direct conduit into the intestine. If there is any doubt as to the patency of the appendix, it should be opened before the bowel is fixed to the parietal peritoneum, so that if necessary appendicostomy can be abandoned and a Gibson cecostomy performed. If patulous beyond a doubt, Tuttle thinks it better to delay opening for two or three days, except when the operation is done for reasons that require it. Even a slender atrophied appendix can be dilated to admit a catheter large enough for irrigation. No hard and fast rule can be given as to closing the appendix: in amebic dysentery, however, Tuttle advises waiting from six to nine months on account of the liability to relapse. The method of closure is very simple. In his experience the nitric acid applied to the mucous membrane has invariably closed the aperture. In general the operation is indicated in all chronic inflammatory diseases of the colon, but it has been used chiefly in amebic dysentery, mucomembranous colitis, and syphilitic ulcerations of the colon. In all these it has proved most uniformly successful. Formulas for injection solutions are given, and a statement of the results in the 61 cases Tuttle has collected. Reports of cases are appended.

A Successful Case of Splenectomy for Rupture of the Spleen.—

SIMPSON, G. S. *Lancet,* vol. clxxi, No. 6 of vol. ii, p. 364, Aug. 11, 1906.

The patient was a man 27 years of age, who fell a distance of about 20 feet. The accident happened at 10 A.M., and he was admitted to the hospital for a fractured hip. By 2 P.M. there was severe abdominal pain. On examination the abdomen was found rigid in the upper part and did not move with respiration. The pulse was 140, temperature 100°, and respirations 50. The liver dulness was present, and there was some dulness in the epigastrium. The abdominal wall was tender on pressure, more so in the upper part. Five and three-quarters hours after the accident, under chloroform anesthesia the abdomen was opened to the left of the umbilicus. Neither gas nor fluid escaped, nor were there any signs of commencing peritonitis. When the omentum was pressed away from the side of the abdomen there was a profuse discharge of dark-red blood, apparently coming from the left lobe of the liver. Examination showed this to be intact, and the spleen being brought into view was found to have a large transverse tear. A long pair of artery forceps was applied to the pedicle, which at once controlled the bleeding. The pedicle was ligatured with silk and the spleen incised. Three pints of saline fluid was infused into a vein. When the patient left the operating table the pulse was rapid and distinct, and he passed a fair night, having a little abdominal pain. During the three months of the patient's stay in the hospital the blood was frequently examined and differential counts made. It showed the usual changes: a diminution of the red corpuscles, which rose to normal in a month. An unusual leucocytosis amounting to 44,000 could be explained by a suppuration of the wound. During the first three months there was no enlargement of the axillary and inguinal glands, but several times since that period they have enlarged and again subsided. There has been no pain in the bones. A fortnight after the operation the pulse was normal and has remained so.

From English sources the writer has collected 70 cases of rupture of the spleen recorded since 1891, which are reported with sufficient fulness to admit of some comparison. From the standpoint of treatment he divides the cases into four groups: where the patients die at once or within a few minutes of the accident; these hardly come within the range of surgery, as no case of successful operation has been done within the first hour. A second group of cases are those in which the symptoms are delayed from twenty-four hours to fifteen days. In a majority of cases, after the initial shock of accident is recovered from symptoms of hemorrhage appear within one to twenty-four hours. There are a few cases in which the symptoms of rupture of the spleen are present which gradually recover without operation. All of these patients should be operated upon.

Present Status of the Treatment of Appendicitis.—

COFFEY, R. C. *New York Medical Journal,* vol. lxxxiv, No. 7, p. 325, Aug. 18, 1906.

The writer has a very instructive paper dealing with the statistics of appendicitis, particularly in reference to the responsibility of the family physician. He refers to Ochsner's original paper on rest and starvation in the treatment of appendicitis, which has been so misunderstood and variously interpreted. By some it is interpreted to mean that no operation should be done during an acute attack of appendicitis, and by others the time limit as laid down by Ochsner is rigidly followed. On the other hand there is the radical class who say that an operation should be made as soon as the diagnosis is determined, regardless of

the surroundings of the patient or qualifications of the operator. These men instruct the people that appendicitis means certain death. They distort the radical side of the subject and bring discredit on the profession, for not more than 15 per cent die if left without treatment of any kind. The tendency of surgeons to befog the discussion with technicality has led to a muddling of the minds of general practitioners. The most essential point is that the surgeon give to the physician more unvarnished facts and less of individual unsubstantiated opinion. It is recognized that statistics are fallible.

The writer has investigated the subject by writing to all of the hospitals in the United States having a capacity of more than fifty beds. He received nearly 300 reports; of these 179 had the reports so classified that accurate figures could be formulated. The hospitals were divided into five groups, according to the number of patients—those having from 1 to 25, 25 to 50, 50 to 75, 75 to 100, and over 100. In all there was a total of 13,445 cases. The total mortality was 7.4 per cent. A significant thing in this table is that the hospitals having the largest number of cases with an average of 13 to each member of the surgical staff gave the lowest mortality, while the mortality-rate in the smaller hospitals was nearly doubled, in the smallest group of hospitals reaching the enormous proportion of 13.7, which approximates the mortality of untreated appendicitis.

Another instructive series of statistics is that bearing upon the mortality of surgeons using the so-called Ochsner treatment. Ochsner and the Mayo brothers with a combined operation list of 1940 cases show a mortality of about 2 per cent; while Deaver and Richardson, who believe in operating at once on every case of appendicitis, have an operative mortality of 5 per cent. The surprising results reached by the Mayo brothers in 1894 with 536 operations and a mortality of only five were reached by applying strictly the rest and starvation treatment in certain acute cases of appendicitis. A possible explanation of these figures may be found in the fact that more interval cases are sent to Mayo brothers than to other surgeons. A study of the mortality statistics shows that there has been a marked reduction in the death-rate of appendicitis since the advent of efficient surgical measures.

The writer finally concludes with the statement that appendicitis is essentially a surgical disease, but that if a surgeon cannot be obtained or if operation is refused, then the Ochsner treatment is by far the best. It should be regarded as essentially a first-aid treatment.

Paraffin Plates in the Treatment of Symblepharon.— Wilder, W. H. *Journal of the American Medical Association,* vol. xlvii, No. 8, p. 570, Aug. 25, 1906.

In the severer cases of symblepharon the ideal operation implies the restoration of the fornix and mobility of the eyeball, or if this is absent, the securing of a cul-de-sac allowing an artificial eye to be worn. While the ideal graft material cannot always be obtained, Thiersch grafts of suitable size may be employed, and he suggests as a material for holding them firmly and smoothly in place sheet lead coated with paraffin, which can be easily shaped by scissors, knife, and file, with a proper opening to fit the cornea. The paraffin, of course, should be hard, with a melting point not lower than 130° F., and the grafts applied to the paraffin, to which they adhere, and the plate inserted into the new fornix after having been covered. The details of his technique are given. He states his conclusions as follows: "The advantage of a plate for holding mucus or Thiersch grafts in place in the fornix of the eyelids is obvious. The advantage of the paraffin plate is that it can do no harm to the cornea.

It can be built up as required to fit any conjunctival cul-de-sac that has to be lined with a Thiersch graft. The graft adheres to the paraffin, so that it can be evenly smoothed out on it, and thus perfect coaptation is secured between the graft and the raw surface of the cul-de-sac. To accomplish this, the graft should be thin and large enough to cover all raw surface, no suture being required. With perfect coaptation the graft will have secured a firm hold at the end of forty-eight hours, and the plate can be removed for cleansing the eye. In case of restoration of the socket for prothesis, it may be left in place for a considerable time, for the sac can be cleaned by irrigation through the holes in the plate. If it is so large that there is difficulty in removing it, it can be cut in two and the subsequent treatment continued with a plate that can be more easily inserted."

The Cure of Chronic Suppuration of the Middle Ear Without Removal of the Drum or Ossicles or the Loss of Hearing.—

HEATH, C. J. *Lancet,* vol. clxxi, No. 6 of vol. ii, p. 353, Aug. 11, 1906.

The tympanum is to be regarded as the strategic position in approaching a suppurating ear. If the cavity of the antrum is unaffected there is a good prospect that the tympanum may not become diseased past recovery. If the antrum is seriously diseased no treatment of the tympanum can be relied on to effect a cure. The drainage from the antrum is through a small bony passage which is easily obstructed; this is followed by enlargement of the cavity behind it, which may take any direction, toward the middle fossa, the mastoid process, or the lateral sinus. Erosion through the bone above the antrum into the middle fossa is very common, while perforations from the attic of the tympanum are relatively rare. This is due to the imperfect drainage of the antrum. The writer's experience is that by opening the antrum and providing free drainage, suppuration of the ear is in a large measure eliminated. The operation is a modification of the ordinary opening of the antrum, the bony meatus being taken away so as to completely expose its cavity and also the drum membrane.

Surgical Treatment of Exophthalmic Goitre.—

SHEPHERD, F. J. *Journal of the American Medical Association,* vol. xlvii, No. 9, p. 665, Sept. 1, 1906.

The writer maintains that in a certain proportion operative measures are curative or lead to decided improvement. The probable cause is hyperactivity of the thyroid, but the part played by the thymus and other causes in this disease complex cannot be entirely ignored. Shepherd thinks that early operation is safest, and that the class of cases most likely to be benefited are not the most severe ones, but those in which the gland is more enlarged on one side than on the other, with more definite tumor formation, and in which the gland is not excessively vascular and the enlargement has preceded the symptoms by years. In those early cases of enlarged thyroid with mild symptoms in which the gland is soft, vascular, and evenly enlarged throughout, the results of operation are usually good. With large vascular thyroid and symptoms of marked toxemia from thyroidism operation should be avoided. He notes the disinclination of most physicians to operate, and gives statistics from various operators showing good after-effects and low mortality. Nor does he consider general anesthesia as specially dangerous in selected cases. Fourteen cases of his own and three of certain of his colleagues are reported. There were three deaths, all in desperate cases, nine complete cures, three patients were much improved, one relapsed, and one has been lost sight of though improvement followed operation. Sixteen of the patients were females. In all the operation was called for on account of distressing symptoms. The diagnoses were clinical. He does not believe the pathology of the disease is sufficiently definite to make the microscopic examination of first importance.

B. J. C

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Pulmonary Tuberculosis in Children.—

SQUIRE, J. E. *British Medical Journal,* No. 2377, p. 133, July 21, 1906.

Tuberculosis is the most common and fatal malady in childhood. The Registrar-General's returns for 1903 show that 16,650 children under 15 years of age died of tuberculosis, fully three-fourths of them in the first quinquennial period. This does not account for all the deaths from tuberculosis, as some may have passed the 15th year and others die of other diseases. The Registrar's report shows tuberculosis from all diseases, though the tendency of tuberculosis in children to become generalized shows that the larger proportion have pulmonary involvement. During the first two years of life tuberculosis tends to involve first the bronchial lymphatic glands and then the lungs, and it is generally the latter which kills. Beginning with the third year tuberculosis of bones, glands, peritoneum, and intestines becomes more frequent. Frequently the lungs are involved in these cases in a diffuse process. After the sixth or seventh year the pathological process resembles that of adults. There is a general belief that the bronchial lymphatic glands are usually involved in infancy first and secondarily the lung, but there is good reason to believe that the reverse order is more frequent than is generally supposed. From the fact that the glands as well as the lung are involved it does not follow that the disease commenced earlier in the glands than in the lung, though it may have advanced more rapidly in the former. In some cases it is evident that the disease has extended from the glands, for the middle lobe is mostly involved, and especially that portion of the root of the lung. In the cases in which the apex of the lung is involved there is more reason to think that the glands became secondarily infected. The possibility of infection through the tonsils and by the way of adenoid tissue in the pharynx should not be overlooked. Middle-ear and mastoid disease are also probable sources.

The simplest division of tuberculosis in children is into two classes, the infantile and adult types. The infantile group may be further subdivided into miliary and bronchopneumonia, and the adult into apical and basic cases. Miliary tuberculosis of the lung is essentially the type associated with generalized tuberculosis in young children. Scattered through both lungs are areas thickly dotted with miliary tubercles, or both lungs may have these small tubercles distributed through their substance. With these gray granulations some parts of the lungs may appear healthy and other portions have the appearance of bronchopneumonia. In such cases diminished resonance and resistance on percussion is found in patches over the whole chest. Breathing is quickened, cough is frequent, and the sputum is generally frothy as in bronchitis. Fever is present, cerebral symptoms are not uncommon, and emaciation is marked. A fatal termination of these cases is almost invariable. Occasionally the symptoms suggest typhoid fever. This type of the disease is not frequently met with after five years of age. The bronchopneumonic type or tuberculous bronchopneumonia has a more prolonged course than miliary tuberculosis. There is as a rule considerable consolidation of portions of the lung. The pleura is generally thickened.

In children over six years of age the adult type usually characterizes tuberculous invasion of the lungs. The base is more frequently involved than in adults. Where the disease extends from a bronchial lesion the mammary gland will be involved, but there is a marked preponderance of the apex cases. In children cough may be absent or slight. Sometimes it is a constant, irritating, dry cough. In another case it may occur in paroxysms suggestive of

whooping-cough, or again it may have the liquid character of bronchitis. Cough and expectoration are less frequent in children than in adults. Hemoptysis is not common in children, but infection of the intestines is frequent. Shortness of breath is also a less pronounced symptom. Fever is present at some time in the majority of cases, and it may be almost continuous and frequently high, with a diurnal range of three or four degrees. The diagnostic difficulty in children is to distinguish between bronchopneumonia and tuberculosis. The physical signs may be identical. If the involvement is limited to the apex it may be fairly inferred that the trouble is tuberculous.

The prognosis in pulmonary tuberculosis in children should be guarded, though the presence of healed lesions on autopsy show that spontaneous recovery is not infrequent in early childhood. In the treatment of children a life in the open air, sufficient food, cleanliness, and abundance of rest and sleep are essential. As a rule children are much better not kept in bed, unless the fever is high and the sickness extreme. Of great importance are the forest open-air schools of Berlin and the seaside schools established by the city of Paris.

In closing the writer says it is economically more advantageous and less costly to keep the children free from tuberculosis and to treat those who become infected than to attempt the cure of a consumptive adult.

Otitis Media as a Complication or Sequel of Scarlatina.—

BIEDERT, C. C. *American Medicine,* vol. i, No. 4, p. 210, July, 1906.

Otitis media is a complication which is likely to do permanent damage to the ears when neglected, and even if actively treated the infection may be so severe as to seriously damage the organ of hearing. It is the most important complication of scarlet fever. Of 5613 deaf-mutes 10 per cent owe their condition to otitis following scarlet fever. In addition to this there are a large number of chronic suppurating ears that owe their origin to this disease. In 25,882 cases of scarlet fever reported by the Metropolitan Asylum Board there were 3833 who developed otitis, a percentage of 14.8. Of these there were 192 cases in which the mastoid was involved. The frequency of the complication seems to be greater in winter than in summer. There is no regularity in the onset, as otitis may occur at any stage. In the more severe forms, those attended with angina, the otitis usually appears during the eruptive stage of the disease or some time during the first week. In these cases the drum membrane may break down in three or four days. In virulent infections there is rapid necrosis of the bone, a fetid discharge, and invasion of the labyrinth, with a total loss of hearing or a meningitis. Where the otitis occurs in the third or fourth week of the disease or during convalescence the onset may be insidious, with slight pain, slight elevation of temperature, followed by perforation of the drum and purulent discharge. The persistence of fever after the child is apparently well should lead to an examination of the ear. The age incidence of otitis is greater in the first quinquennial period, decreases in the period from 5 to 10, with a further fall from 10 to 15, and in the period from 15 to 19 less than one per cent of cases suffer from this complication.

The pathology of the otitis media of scarlet fever does not differ from that of the other infectious fevers. In a majority of cases it extends from the throat or nasopharynx through the Eustachian tube. Inflammation of the middle ear may follow in any of the acute infectious diseases. The mild exanthemata as a rule involve only the lower portion of the middle ear, while in the more severe infectious diseases the otitis usually has its origin in the upper portion of the tympanic cavity and constitutes a cellulitis. This results in extensive necrosis, the formation of pus, and extends to

the bony structures. Inflammation of the upper portion of the tympanic cavity is a disease of considerable gravity, and one which demands prompt measures. Inflammation of the lower portion is comparatively simple if it is confined to that region. The less active infections are not sufficiently virulent to attack connective tissue structures.

The treatment is both prophylactic and curative. A systematic and routine examination of the ears should be made in all cases of scarlet fever. The throat and nose should be carefully examined, but irrigations of the nose should not be used. The nose may be cleaned by a gentle spray three or four times a day. If an inflammation results perforation should always be anticipated by a free incision of the drum membrane. By waiting for spontaneous rupture more of the drum is sacrificed and there is greater danger of intracranial infection. The incisions should be made at the lowest point of the bulging drum, and should be large enough to drain freely. If done early before the serous effusion has become purulent and under antiseptic precautions, the formation of pus may be prevented and recovery hastened. As a rule this operation gives instant relief from the pain. Local bloodletting and warm instillations of boric solutions or hot or cold applications externally are indicated in some cases. An acute otitis should never be allowed to become chronic. If the discharge becomes purulent the canal should be kept clean and the pus removed by gentle irrigation of warm boric solution or some mild antiseptic. In some instances the canal may be swabbed with hydrogen dioxide on a cotton applicator, followed by the use of alcohol, or a little antiseptic powder, such as boric acid or aristol, should be insufflated. A light packing of antiseptic gauze carried down to the perforation should be used to secure free drainage. If carefully carried out such a plan of treatment will be followed by a normal and useful ear.

Prolapse of the Uterus in Pregnancy.—

ANDREWS, H. R. *Clinical Journal*, vol. xxviii, No. 14, p. 221, July 18, 1906.

Cases of prolapse during pregnancy may be divided into: (1) cases of prolapse of the uterus, and (2) cases of hypertrophy of the cervix. In most cases of pregnancy with prolapse the symptoms due to the prolapse are increased during the first two or three months of pregnancy. The morbid manifestations consist of greater frequency of micturition, a discomfort from a sense of weight, and if the cervix is external it is likely to be swollen and ulcerated. By the end of the third month or a little later the body of the uterus rises out of the pelvis, and the cervix is drawn into the vagina. If the prolapse is very great the uterus may remain in the pelvis, symptoms of incarceration occur, and if the condition is not relieved, an abortion.

In cases in which the prolapse is of the second degree there is usually elongation of the supravaginal portion of the cervix to such an extent that the sound passes 4½ to 5 inches. Hypertrophic elongation of the cervix affects the vaginal portion of the cervix and may resemble or be accompanied by prolapse. In such cases the cervix may become so much swollen that the uterus is unable to rise out of the pelvis. Clinically the two conditions may be considered together.

In treating this condition during the early months the uterus should be pushed up and a soft, ringed pessary inserted. Care must be taken that the fundus is pushed up, otherwise the uterus may be doubled on itself, the cervix going upward while the fundus goes down into Douglas's pouch. To avoid this the patient should be placed in the knee-chest position. If there is any difficulty in effecting the reposition the patient should be kept at rest in bed for twenty-four hours, and then another attempt made. The ring pessary should be removed by the end of the fourth month of pregnancy,

as it need not be worn beyond that time. As a rule the cervix becomes much diminished in size when it is freed from the constricting effect of the vulvar orifice. If a ring cannot be retained some sort of a cup-and-stem pessary must be used. In one instance the writer has performed ventral fixation during the first month of pregnancy. In that case it was successful, though operation at that time is not to be recommended.

Where the cervix remains outside of the vulva throughout pregnancy it not only becomes edematous but very firm and tough, and may be the cause of difficult labor. The thickened cervix dilates very slowly, and it may be necessary to incise it. There is some danger of rupture of the lower uterine segment on account of the mechanical obstruction to delivery offered by the thickened cervix due to the prolonged pressure to which it is subjected. There is also the additional danger of septic infection when the cervix is sloughing.

Infantile Paralysis.—

STILL, G. F. *Clinical Journal,* vol. xxviii, No. 15, p. 225, July 25, 1906.

While infantile spinal paralysis is the most common of all forms of paralysis in childhood many of the questions connected with its pathology and clinical manifestations are unsolved. The symptoms are commonly explainable by involvement of the anterior horns of the spinal cord, though some cases cannot be distinguished from primary peripheral nerve affection. The disease is rather more common in boys than girls, and is most frequent during the second year of life. In this respect it corresponds with certain other infective diseases of childhood which have their largest maximum incidence in the first three years of life. Nearly two-thirds of the cases begin between June and the end of September, with the largest number during the months of August and September. The tendency of this paralysis to appear associated with or after the infective fevers would suggest that the disease is infective in its nature, but it may be thrombotic, the disease having produced changes in the vessel walls. The strongest argument in favor of an infective origin in the absence of bacteriological proof is the fact that epidemics of infantile spinal paralysis occur. A peculiarity of the cases which occur in epidemics is their higher mortality. In the one which occurred at Rutland, Vt., there were 18 deaths in 126 cases, while death in the sporadic cases is exceptional. Again, the symptoms in the epidemic form often bear a resemblance to cerebrospinal meningitis, and complete recoveries have been noted in the epidemic form, while complete recovery in the sporadic cases is very rare.

There are three types of onset of the disease: In the first type it begins with the symptoms of an acute illness more or less severe lasting a few days, with pyrexia and drowsiness. There may be vomiting, headache, constipation, and some pain in the back or limbs. As the illness passes off it is noted that there is paralysis in one or more limbs. This first type is the most frequent and fits in well with the idea of infective disease. A second type is one in which the disease is insidious in its onset, and the first thing that is noted is weakness, and this only after there is considerable muscular wasting. A third type is one in which the disease is very abrupt. The child may be running about at play, falls down, and when picked up one leg is found to be paralyzed. The lower limbs are most frequently paralyzed. In some instances the paralysis is paraplegic in type, and again it is crossed. Thus the right upper extremity and the left lower may be involved, or reversed. In about five per cent of the cases all four extremities are involved. The trunk muscles are not infrequently involved. Twice in a series of 87 cases the writer has observed

paralysis of the diaphragm. The spinal muscles may be involved so as to lead to lateral curvature. The secondary deformities which occur, such as talipes, may lead to a greater disability than the mere muscular paralysis. The sphincters are sometimes involved early in the case, but these symptoms never persist beyond a fortnight. The prognosis is unfavorable so far as the paralysis is concerned, but the sporadic cases rarely endanger life. When death occurs it is almost always during the first week or two of the disease.

A Study of the Stools of Breast-fed Infants in Relation to the Presence of Starch Enzyme.—

KERLEY, C. G.; MASON, H. N.; and CRAIG, H. A. *Archives of Pediatrics,* 27th year, No. 7, p. 489, July, 1906.

During the past eighteen years the writers have been in the habit of using cereal gruels in infant feeding both as an adjunct to a milk diet and as a substitute for milk in cases of illness. The results have been more satisfactory with cereal decoctions than with any other method. The statement that has been frequently made, but is unsupported by proof, that cereal gruels cannot be digested by the very young and hence are useless does not agree with clinical observations.

To study this question they examined 324 stools of 60 infants on an exclusively starch diet. It was given in amounts from 142 to to 1560 grains. The average was from 400 to 500 grains in twenty-four hours. In testing for starch in the stools the von Jaksch iodine method was employed. In 33 infants the stools were persistently negative, five examinations having been made on five successive days. Of these 11 were under six months of age. Seven were persistently positive, showing starch in considerable amount at each examination. In 20 the examinations were sometimes positive and sometimes negative. The results of the test showed that 41 infants had a good starch capacity and 19 an indifferent or poor starch capacity. That some of the starch may have undergone fermentation in the intestine is possible, but it was not a factor of consequence as the patients did not evidence more bowel distention than usual. Dextrin was present at times in over one-half of the cases, showing a partial conversion due to the presence of a starch enzyme, and the children were maintained in fair nutrition during the period of exclusive starch diet. Another branch of the inquiry related to the determination of the presence of a starch-converting enzyme in the stools. This was demonstrated by digesting a starch solution with a portion of the feces, and it was found that an enzyme was present which was capable of converting starch into sugar. The examinations were made on the day of birth and were continued several days, four examinations being made in each. That the conversion was not due to the presence of bacteria was demonstrated by agitating the feces with water and passing the filtrate through a Berkefeldt filter. These observations agree with those of von Jaksch and Moro. They negative the conclusions of Zweifel and Korwin, who were unable to obtain diastatic enzyme from the pancreas of children under three weeks old, in which they claimed that none existed.

The Fat Percentage of Mother's Milk as a Factor in Infant Feeding.—

TAYLER-JONES, L. *Archives of Pediatrics,* 23d year, No. 7, p. 493, July, 1906.

Attention is called to the importance of a chemical examination of breast milk when an infant is not thriving. The mere fact that an infant does not do well when it is breast-fed is no reason for placing it on artificial food. Human milk should contain 4 per cent fat, 7 per cent sugar, and 1.6 per cent proteid. When the baby is not doing well the milk should be analyzed, and it will frequently be found that

some change in the hygiene or diet of the mother will alter the milk. In a case which recently came under the writer's observation the fat was found in the proportion of 6.4 per cent. In this case the exercise of the mother was lessened, and the amount of meat and milk in the mother's diet was lessened, so that there was a prompt fall in the fat content of the milk to 3.4 per cent and an increase of the proteids to 1.35.

In conclusion the writer says: (1) The importance of mother's milk cannot be overestimated. A physician should feel that he is taking the baby's life in his hands in lightly changing from breast milk, and should so impress the mother. Besides the immediate danger, which at times is not so great, it lessens the stamina in later years. A right start in anything is essential, but nothing is more important than a right start in life. (2) If there is some disturbance to the nursing infant, the breast milk should be examined, unless some cause, like tuberculosis, is at once recognized. It is not long since patients were pronounced anemic upon looking at them, but to-day the hemoglobin must be estimated. So must it be with breast milk. (3) Fat is an important factor if only for its variability. (4) The importance of the fats has increased lately, since the Breslau investigators give them such an important rôle in infantile atrophy (marasmus). (5) For the most part fat gradually increases in amount from the beginning to the end of a feeding, with occasionally a drop down at the end. As yet there is no proof that the increase is arithmetical. A baby that needs more fat than it is getting can easily be put to the breast after some milk has been pumped out. (6) A fat percentage within a few tenths of a per cent of the average may be obtained by taking equal specimens from the beginning and end of the feeding and examining the mixture. This is practical clinically and should be done.

Alcoholic Dextrins in Some Cases of Marasmus.—

SYMES, W. L. *British Journal of Children's Diseases,* vol. iii, No. 7, p. 290, July, 1906.

The writer refers to the value of malt preparations in the treatment of certain forms of marasmus or essential atrophy. He includes the large class of food cases in which the feeding has been improper, which induces disorganization and morbid secretions of the digestive glands. Among this varied group will be found hypertrophy of the pylorus, pyloric stenosis, pyloric spasm, congenital malformation of the duodenum, stenosis of the esophagus, and enlarged retropharyngeal glands. In cases which have defied all the most approved methods of feeding, where cow's milk has failed and has been abandoned, even though skilfully modified, and where breast-feeding has likewise failed, and particularly where the so-called marasmus foods have failed, such as bread, jelly, wine whey, eggs, meat juice, and brandy, the writer has resorted to Dublin stout, the XXX brand. With its use there comes a marked improvement in the conditions, and soon he is able to add some proteids and fat to the diet.

The writer has had good success in the administration of porter or stout to infants that were collapsing. He does not claim that every case of atrophy can be treated in this way, but it is applicable to some cases, those in which milk and cream mixtures disagree and other methods fail. He points out that XXX stout is a carbohydrate in one of its most soluble forms, and it contains a small quantity of alcohol, which is often indicated. Stout is, roughly speaking, an extract of malt, containing no starch, no sugar, with a small quantity of alcohol, averaging about 5 per cent. Proteids can be supplied with it in the form of beef juice and fat by the addition of cream or yolk of egg. The mixture is not unpleasant, and the child takes it well from a bottle. It

mixes with milk not only without harm, but also aids in its digestion. If the child is breast-fed the porter does not disagree.

An analysis of the different forms of stout and porter brewed by Guinness is given. This shows that the XXX stout contains by weight 5.6 per cent of alcohol and 8.8 per cent of solid matter. The writer suggests that hopwort, which is unfermented stout, might be successfully used in the feeding of infants where the alcohol was contraindicated. It is a thick, sweet, brown liquid, containing all the ingredients of stout, except that sugar replaces the alcohol.

Food Value of Whey Proteids.—

JUDSON, C. F. *Archives of Pediatrics,* 23d year, No. 7, p. 504, July, 1906.

Mixtures of cream and whey, milk and whey, plain or diluted with water, have come into general use of late years in the feeding of infants who are not able to digest weak milk mixtures. The chief advantages claimed for whey are that it is free from insoluble casein, and that it contains soluble albuminoids in the form of lactalbumin and whey proteids. It only contains 0.33 per cent of fat. Whey does not readily sour, and if ordinary precautions are taken to keep it clean, it will remain sweet for a considerable time. The writer has made a number of experiments to determine the proportion of proteids in whey, and finds them to be approximately one per cent. In this he agrees with other authorities. An estimate was made of the amount of nitrogen which exists as extractives, and it was found to be approximately 10 per cent, so that the proteid food value is about 0.85 to 0.90, consisting of whey proteid and whey albumin. The results were practically identical whether skimmed milk was used or whole milk. Indeed, the source and quality of the milk seemed to make little difference in the results.

FORENSIC MEDICINE AND TOXICOLOGY.

Medicine and the Law in the United States.—

British Medical Journal, No. 2379, p. 268, Aug. 4, 1906.

A writer in the *British Medical Journal* has reviewed the actions reported in the general digest of cases. He states that actions against physicians appear to be more common in this country than in the United Kingdom, and that in many cases they are founded on very flimsy grounds. In this latter opinion we heartily concur.

In the case of Bigney *vs.* Fisher, which was heard in Alaska, it was decided that the implied contract of a physician treating a fractured limb is not to restore it to its natural perfectness, but to treat it with that degree of diligence and skill which is ordinarily possessed by the members of the profession in similar localities, regard being had to the state of the medical profession at the time. There is nothing new in the principle here enunciated: it might almost be the dictum of an English judge in an ordinary action for malpractice. In another case it was apparently alleged that a practitioner had been guilty of negligence in not visiting his patient sufficiently often. The court in this instance came to the conclusion that the question whether a physician is negligent in permitting certain intervals to elapse between his calls on his patient depends on the custom in similar localities in the treatment of similar cases, and not upon the custom of any particular physician in his own practice (Tomer *vs.* Aiken, 101 N. W., 769). The same case is also cited as an authority for the proposition that the failure of a physician to effect a cure of a dislocated clavicle is not evidence of want of care or skill, where it is shown that the results are not always satisfactory under any form of treatment, and there is no assurance that the bone will permanently remain in place. Where an action for negligence was brought

by a father against a physician for failing to diagnose a case of diphtheria, the plaintiff alleged that the diphtheria developed at least two days before the death of the child, during which time she was being treated by the defendant. The defendant contended that the disease did not develop until within twelve hours before the child's death. It was held admissible to ask an expert witness whether it was possible for a child to show no symptoms of diphtheria on one day and develop fatal symptoms on the next (Purcell *vs.* Jessup, 91 N. Y. S., 165).

The following extraordinary action against a dentist may also be noted: The plaintiff complained of a "clicking" or disagreeable sound made by the movement of the jaw, said to have been caused by the defendant. The defendant sought to call a number of witnesses to prove that they were similarly affected. It was held that he could not call these witnesses, inasmuch as the plaintiff did not claim that the condition could be produced only by a dental operation (Mernin *vs.* Cory, 79 P., 174).

The case of Shead *vs.* Tomlinson (59 A., 376), which appears to have been tried in Alaska, may also be noted. From that case it would seem that certain American courts actually recognize the Christian scientist as a physician (of a kind), and in answer to a charge of negligence against such a person will entertain the plea that the defendant acted as a Christian scientist healer ought to act. In that case the patient, who applied to a Christian science healer for treatment of appendicitis, was told to keep about the room the same as usual, to eat anything she wanted, and not to lie down. It was held that there being nothing to show that these directions interfered with Christian science practice, they were not evidence of such deviation therefrom as to render the healer liable for negligence. The standard of care by which a Christian science healer is to be judged is the care, skill, and knowledge of the ordinary Christian scientist who undertakes to treat diseases according to the method practiced by such healer, and not that of the ordinary physician. The court apparently expressed the view that "the intelligent and voluntary consent to follow the advice and abide by the result of the prayers of a Christian science healer precludes the recovery of damages for negligence, based on the ground that public policy is opposed to such treatment."

Seeing Patients in One State and Sending Medicine from Another.—

Journal of the American Medical Association, vol. xlvii, No. 5, p. 386, Aug. 4, 1906.

The Supreme Court of Missouri, Division No. 2, in the case of State *vs.* Davis disposes of a peculiar attempt to evade the medical practice act of Missouri. The defendant Davis had a room in a hotel in Memphis, Mo., and held himself out to be a physician. One Hoover applied to him for treatment. He diagnosed his case in the usual and ordinary way of practicing physicians and prescribed remedies. The patient had to send to Warsaw, Ill., for the medicine, which was paid for at the rate of $5 per month. The court in this instance found that it was only a clumsy attempt at evasion of the medical practice act, and in fact that the defendant was practicing medicine within the meaning of the act and while he was unauthorized to do so. The court says: "It is but common knowledge that the people who have ill health or whose families are troubled with disease are more easily and can be more readily imposed on by persons who represent themselves as physicians, claiming that they can give them permanent relief, than any other class; and it may be added that intelligence is no protection from impositions along that line, for when a man is sick or his family ill, whether they be intelligent or ignorant, they readily give an attentive ear to any sort of a doctor

who claims that he can give them relief, and are at all times ready to purchase and swallow all sorts of nostrums because they are recommended by some one who claims to be a physician. The prime object of the Missouri law on the subject of the practice of medicine is the protection of the people from the impositions herein indicated by persons who are not sufficiently skilled in the profession to authorize them to properly administer medicine, and therefore relieve the afflicted. It is apparent that the general assembly of Missouri, in the enactment of the provisions of law regulating the practice of medicine and surgery in Missouri, intended to fix a standard of fitness, skill, and qualification which would authorize the practice of that profession. This law does not undertake to deprive any person of a vested right, for there can be no such thing as a vested right in the practice of medicine. It does not undertake to suppress or prohibit the practice of medicine or surgery, nor to prohibit any particular person from practicing as a physician or surgeon, but it simply undertakes to require the necessary and essential qualifications for that purpose."

Employer Not Required to Provide Necessary Medical Attendance.—

Journal of the American Medical Association, vol. xlvii, No. 8, p. 638, Aug. 25, 1906.

The Supreme Court of Oregon in Miller *vs.* Beaver Hill Coal Co. has handed down a decision which may be of interest to physicians generally, and particularly those who have charge of industrial enterprises in which the men contribute for the maintenance of a hospital and medical service. The facts in this case were that a man who had been injured was taken to a hospital for operation, but the physician in charge was temporarily absent, and his assistant did not with the facilities at hand feel justified in operating. He secured a surgeon from a distance, who charged $250 for his services. The injured man brought suit against the company, claiming that the $1.50 a month which had been taken from his wages for medical service and the support of the hospital should have provided the medical attendance. A verdict for the plaintiff was reversed by the Supreme Court on the ground that the only liability assumed by the company in collecting the fund was to expend it for the purpose for which it was subscribed, and no other. The mere fact that it received or exacted the contribution did not impose on it the absolute duty to furnish every contributor all the medical or surgical attendance that he might need or require, whether the fund provided was sufficient or not. The only duty of the company was to use ordinary care in the expenditure of the money and in the employment of physicians and surgeons in charge of the hospital, and it was not responsible for the negligence of the surgeon so employed in going away and leaving the hospital in charge of another.

Personal Liability of "Company" Officers.—

Journal of the American Medical Association, vol. xlvii, No. 3, p. 233, July 21, 1906.

The United States Circuit Court of Appeals discusses the liability growing out of a licensed corporation doing business in the State in which it is not qualified to carry on its work (Mandeville *vs.* Courtright). The defendant company was incorporated in the State of New Jersey, and carried on in the State of Pennsylvania in the name of the corporation the business of dentistry, a thing which the corporation had no right to do under the Pennsylvania law. The plaintiff, in ignorance of the existence of such a corporation, and supposing that she was in the hands of licensed dentists, submitted herself to an authorized employee of the establishment, who operated on her mouth

so negligently and carelessly as to fracture the jaw bone and cause her serious injury. In such a case the court rejects the idea that the defendants can escape personal liability by setting up the charter of the company. The person who operated on the plaintiff's jaw was unlicensed as a dentist and lacked experience, knowledge, and skill, and the facts disclosed justified the jury in awarding the plaintiff exemplary damages.

Insane Heredity and Suicide in Relation to Testamentary Capacity.—

Journal of the American Medical Association, vol. xlvii, No. 8, p. 638, Aug. 25, 1906.

The Court of Appeals in New York says in the case of Roche *vs.* Nason that the mere fact that a person came to his death by his own hand within a few days after executing a codicil to a will does not justify the inference that the instrument was drawn with suicidal intent. If the will was drawn with the act in contemplation it does not necessarily affect the will. In this case there was insanity shown in the ancestry of the testator, but this cannot be taken as any inference of mental unsoundness in the absence of evidence tending to show manifestation of derangement during the testator's lifetime. Mental derangement cannot be predicated solely on suicide, as experience often shows that sane men destroy themselves.

Affliction With a Loathsome Disease Cannot Be Condoned.—

Journal of the American Medical Association, vol. xlvii, No. 5, p. 386, Aug. 4, 1906.

The Court of Appeals of Kentucky says in Hooe *vs.* Hooe that the ordinary rule of condonement does not apply to a loathsome disease. It was claimed in the case that after the wife had knowledge that the husband was affected with such disease she continued to live with him, and this was pleaded as a bar to divorce proceedings. The court points out the distinction between acts of adultery, those growing out of temper or drunkenness which may not be repeated, and a continuing offense such as a loathsome disease, not a distinct or separate grievance that may be forgotten and forgiven in a day or a week, or a species of misconduct that affectionate treatment and gentle behavior might obliterate. The court says that it may have been declared to be the law in other jurisdictions that offenses such as this can be condoned, but it has never been so ruled in Kentucky. It was probable that the defendant when the marriage was consummated believed that he was well, but his innocence in this respect does not affect the question presented.

PUBLIC HEALTH.

Some Social Factors in the Causation of Infantile Mortality.—

DIVINE, T. *Lancet,* vol. clxxi, No. 3 of vol. ii, p. 142, July 21, 1906.

The writer points out that the factors which contribute to infantile mortality should be studied in their complex operation. It is easy to see how the industrial employment of married women conduces to the neglect of infants. It is quite exceptional to find a woman who can carry on hard work and nourish her child properly, not to speak of the more indirect duties pertaining to the infant's health. In manufacturing towns the infantile mortality is large, greater than in non-textile towns, where mothers usually nurse their own children. The employment conduces to neglect in different ways, but by far the most important is the absence of the mother from home and from the child, which involves artificial feeding. A comparison of towns in which many married women were employed with those in which few or none were employed shows a distinctly higher infant mortality in the former. Over-

crowding frequently sums up the factors of poverty, intemperance, crime, and domestic unhygiene. The Registrar-General says: "The direct consequences of close aggregation are probably as nothing in comparison with its indirect consequences. The more crowded a community the greater, speaking generally, is the amount of abject want, of filth, of crime, of drunkenness, and of other excesses, and the more keen is the competition and the more feverish and exhausting the conditions of life. It is in these crowded communities that almost all the most dangerous and unhealthy industries are carried on. It is not so much the aggregation itself as these other factors which are associated with aggregation that produce the high mortality of our great towns and other thickly populated areas." In estimating the density of population it is the number of persons to a room and not the number of persons to an acre which should be considered. There is a close connection between overcrowding and infantile mortality, and the statistics of deaths among the young throughout England show that where the number of persons per room exceeds two the infantile mortality is relatively higher.

In a study of the statistics of English towns and cities it is found that there is a close relation between birth-rate and infantile mortality. The birth-rate and infantile mortality-rate is found to be lowest among the well-to-do classes.

A study of the incidence with which these three factors operate in a given locality shows its position as to infantile mortality. Thus a lowered birth-rate may balance a larger proportion of employment among married women, and correspondingly overcrowding may account for a high mortality-rate where the other factors cut little figure. Thus, Bradford has a large proportion of employed married women, and there is much overcrowding, but its low birth-rate places its infantile mortality also low. Swansea and Cardiff have comparatively few married women employed, and there is little overcrowding, but the high birth-rate brings up its infantile mortality-rate.

Municipal Control of Tuberculosis.—

COPLIN, W. M. L. *American Medicine,* vol. i, No. 4, p. 216, July, 1906.

Confidence is expressed in the conservation of public health by wise and justly administered laws. Building inspection should insure stability and proper hygienic supervision of construction. The laws should guarantee to every dweller that the house which he proposes to build, purchase, or rent and the store and workshop shall be so constructed as to offer no perils to his health and be free from those dangers the sum total of which go far to determine the incidence of tuberculosis. Darkness, dampness, and dirt are the gardens in which the tubercle bacillus thrives, sunlight and cleanliness are its greatest enemies. Dust must be reduced to a minimum, and particularly is this true with regard to certain occupations. Among tradespeople 17 per 10,000 living die of tuberculosis, 33 among barbers, 40 bookkeepers, and 54 stonecutters. In 360,000 dark interior rooms 30,000 people are tuberculous.

No other arguments are needed to impress the importance of municipal supervision of house construction and the exercise of sani tary authority over the architecture of homes and workshops. Impure air and inadequate ventilation and overcrowding are powerful aids in the perpetuation of this malady. The death or removal of a tuberculous patient from a habitation should be followed by its thorough cleansing and complete disinfection. That this work may be properly carried out some system for the registration of tuberculous cases is necessary. The streets and alleys of a city should be kept clean and the antispitting laws should be enforced.

The food supply of a great city is a problem

of great perplexity. Meat and milk inspection should be rigid. Particular care should be exercised to prevent tuberculous individuals handling and dispensing food. Garments may be a source of infection, particularly those which come from crowded sweat-shops containing tuberculous workers. Outdoor occupations for the tuberculous will save many lives and reduce to a minimum the dangers to the community. There should be systematic instruction to the tuberculous regarding the means which are to be used to prevent the spread of the infection. For this purpose the schools should be employed to disseminate sound doctrine and to inculcate those principles of hygiene which tend to prevent the development and spread of the disease.

East African Diseases.—

SENN, N. *Journal of the American Medical Association,* vol. xlvii, No. 7, Aug. 18, 1906.

The writer describes the work being done by the Germans in their fight against disease in their East African possessions. He praises the methods of the German government in its management of its African colonies, but says the most in praise of the sanitary work that is being done, especially in the line of preventive medicine under the general direction of Germany's greatest bacteriologist, Professor Koch, who is at present in Africa for the third time. A sketch is given of the researches on malaria of Dr. Ollwig at Dar-es-Salaam, which have furnished the basis on which is founded the Koch prophylactic treatment. The attempts to destroy the mosquitoes by draining and oiling their breeding-places having failed to reduce the prevalence of the disease, the prophylactic quinine treatment was tried, and malaria has greatly diminished.

A number of interesting points brought out by the German investigators are noticed, and Dr. Senn thinks that it is only a question of time before the country will be made safe for Europeans, so far as malaria is concerned. At present, while there are upland non-malarial regions in German East Africa, in the lowlands, and especially along the coast, malaria is alarmingly prevalent. Tuberculosis is beginning to appear among the natives, and Senn fears that it will increase in prevalence in spite of all efforts against it. Relapsing fever is conveyed by ticks, and can be easily avoided by shunning native huts and camping places. Sleeping sickness is the most formidable African disease at present, and the chief facts regarding its cause and spread are mentioned. It does not seem to have reached the coast as yet. Ankylostomiasis is extremely prevalent, but few Europeans are affected. The thymol treatment has not been altogether satisfactory, and beta-naphthol will be given a trial. Bubonic plague has appeared in the northern German possessions, but strict sanitary measures will probably prevent its spread. Appendicitis seems to be unknown among the blacks and cancer is extremely rare, only two well-authenticated cases having been heard of by Senn. The article is to be continued.

The Scope and Aim of State Sanatoria for Tuberculosis.—

BOWDITCH, V. Y. *Journal of the American Medical Association,* vol. xlvii, No. 5, p. 317, Aug. 4, 1906.

To Bodington is given the credit of having first conceived the outdoor treatment of tuberculosis. He ended his days in an insane asylum, but whether placed there because of his advanced theories or for other reasons is not stated. Brehmer in Silesia proved that consumption could be cured, and gradually his views were accepted both in his own country and in foreign lands. Trudeau was the first in America to give practical proof of what can be done to lessen the ravages of this disease. Within the last ten years the idea of sanitarium treatment of tuberculosis has been exploited with great rapidity, and it is now likely to be

overdone. The fresh-air treatment can be pushed to an extreme, and with marvelous results, in cases with sufficient vitality to resist the rigors of a northern winter, but such treatment is foolish and cruel in advanced cases or in old people in whom vitality is low. Disappointment and reaction are inevitable unless experience and judgment direct this movement.

The writer's experience of over seven years in the State sanitarium at Rutland, Mass., enables him to speak with some authority on the subject of tuberculosis sanatoria. Such sanatoria should be built far from cities and restricted solely to incipient cases, or for those in whom the disease has not progressed so far as to preclude a life of usefulness. Far-advanced cases should not be sent to such institutions, but for them hospitals of different construction should be provided within easy access of large cities, so that friends and relatives can easily visit the patient. Sanatoria should not be so large as to prevent a critical study of each case. If public sanatoria for the tuberculous are to be kept above the level of mere boarding-houses, they should be properly supervised by medical men.

The Fetish of Disinfection.—

CHAPIN, C. V. *Journal of the American Medical Association,* vol. xlvii, No. 8, p. 547, Aug. 25, 1906.

The value of modern disinfection methods, as applied after cases of contagious disease, is questioned by Chapin, who, while not denying the possibility, thinks that cases of transference of disease by infected articles and dwellings are rarely well authenticated. In his experience of twenty-two years as health officer he has seen very few of them, and has become convinced of their comparative unimportance. We are apt, he thinks, to overestimate the vitality of germs outside of the body and to underestimate the importance of mild unrecognized cases of infectious diseases as factors in its spread. Healthy individuals are also carriers of disease germs, and as such are more numerous than the mild unrecognized cases of the disease itself. A good deal of disinfection, moreover, does not disinfect, and the futility of disinfecting houses and things when we are not sure that the persons inhabiting them or using them are themselves non-infectious is obvious. A practical test of the non-utility of disinfection has been made in Providence. During the past year the warning card has been removed without disinfection in 258 cases of diphtheria, and there has been a recurrence in the family within two months in four cases, or 1.55 per cent. In eighty-seven cases in which disinfection was practiced during the same period, or a few months preceding, there was a recurrence in 2.3 per cent of the cases. The overestimation of the value of disinfection is, he thinks, the greatest hindrance to the development of better methods of handling disease and guarding against infection.

Malaria and its Transmission.—

MCGIBBON, S. *Montreal Medical Journal,* vol. xxxv, No. 8, p. 513, August, 1906.

The writer does not go into a critical résumé of our knowledge of the transmission of malaria, but makes a few notes on his own observations while practicing in a malarious district in Mexico. He calls attention to the frequency in such districts of the presence of the malarial parasite in the blood without subjective sensation, fever, or other evidences of malarial invasion. A number of such cases came under his observation, and he especially emphasizes the importance of physicians constantly using the microscope when practicing in malarious districts. He advises that a small box be carried containing cover-glasses and a lancet, so that the blood can be examined in all cases whether presenting evidences of malaria or not. It is a frequent cause of obscure symptoms that would not suggest paludal infection. His ex-

perience abundantly confirms the theory that the anopheles is the all-important agent in the spread of this infection, but that it is the only source of infection he is inclined to doubt. He has found the malarial parasite in children born in the mountains of Mexico far from any possibility of attack by mosquitoes. The frequency of fleas led him to examine the probability of its transmission by these parasites. Obtaining some fleas, he had them bite malarial patients, and he subsequently found the spore-forming malarial parasite in the blood of these insects. This is not positive proof that the flea is capable of inoculating an uninfected person, but it is at least suggestive.

Duty of the Citizens of Southern California in the Prevention of Tuberculosis.—

KRESS, G. H. *New York Medical Journal,* vol. lxxxiv, No. 7, 331, Aug. 18, 1906.

The writer in an address before the Southern California Antituberculosis League stated that Southern California had a tuberculosis problem to meet. The league was not formed to present the incomparable advantages of Southern California as a climate for the tuberculous being made available for the many, but it is important to remember that its equable climate, cool nights, and sunshiny days are of little service to the indigent patient. The one who comes here without money will have his appetite stimulated and correspondingly his expenses increased, and he cannot live on air and sunlight alone. He must have nutritious food in ample amount and means sufficient to provide appropriate lodging. Notwithstanding these important considerations from 50 to 75 per cent of the consumptives who come from the East are poverty-stricken. These indigent tuberculous patients are a serious menace to the public health and a grave additional burden on the poor rates. The Southern California Antituberculosis League has as one of its objects the prevention of the spread of this disease among the native population, and it is the duty of the citizens of this section to prevent eastern consumptives from flooding the State and becoming a source of danger to the native population. It is vital for the health of that section that a system of compulsory registration should be devised.

Outbreak of Pneumonia in a Reformatory School.—

OLIVER, T. *Lancet,* vol. clxxi, No. 3 of vol. ii, p. 149, July 21, 1906.

Some four years ago the writer observed a small epidemic of pneumonia occurring in a reformatory having 200 boys. The outbreak occurred in May, and during the previous month there had been one case of fracture, one of skin disease, and three cases of abscess. In all there were eight cases of pneumonia between May 18 and June 5—that is, in eighteen days. The ninth and only fatal case occurred fifteen days later. The illness had the ordinary characteristics of croupous pneumonia, and there was nothing unusual or peculiar in the course they ran. A striking fact was that most of the cases occurred in one large dormitory, which was overcrowded, and the ventilation of which was defective. The light admitted to this room was also deficient.

Pernicious Effects of Alternating Currents of High Voltage.—

MILLENER, F. H. *American Medicine,* vol. i, No. 5, p. 255, August, 1906.

The writer has noted in large electrical plants along the Niagara river, where currents of enormous quantity and high voltage are employed, a marked effect on the health of the employees. In all he has studied twenty-four individuals who are working in the neighborhood of great electric generators. The most of them suffer from digestive disturbances, lose their appetite, become anemic and dyspeptic. They often have to take short periods of rest in order to recover their ability to eat and digest food in a normal manner.

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EDITORIAL.

MOUTH INFECTION.

There is increasing evidence that mouth infections play an important rôle in the causation of certain important diseases. In that very severe disorder facial neuralgia the demonstration of the relation of mouth infections is difficult, but there is scarcely an observer but believes that it has its origin in disorders of the teeth and their sockets. It is true that the removal of diseased teeth is not often followed by improvement in the neuralgia, but it is possible in these cases that the trouble has already passed beyond that portion of the nerve which supplies the teeth, and when it has reached the trunk of the nerve, or possibly the Gasserian ganglion, it is hardly reasonable to expect that mere removal of what was the starting-point of the disease would effect any improvement. Two most severe and intractable affections, progressive muscular atrophy and leukemia, have recently been attributed to suppurations about the mouth. If we add to this list the longer recognized, and which perhaps in the aggregate cause far greater suffering, such as disturbance of digestion due to imperfect mastication and the direct impairment of digestion due to the local action of toxins on the stomach, we have quite a bill of morbidity attributable to disease of the mouth and teeth. The prevention of these disorders as well as the preservation of the teeth from an esthetic standpoint should lead to the inculcation of the utmost cleanliness in the care of the teeth. Various substances are sold upon the market which are reputed to be of value in preserving the teeth. They are marketed in attractive looking packages under euphonious names. It is possible that their chief value lies in the returns which their producers get exploiting them. They are probably not harmful, and some of them may be of positive value, though all that is needed in the care of the teeth is the mechanical removal of the secretions which adhere to their surfaces, and especially between them and along the margin of the gums. It is probable that a thorough brushing with simple warm water is all that will be needed to preserve the teeth indefinitely providing the dentist is called in to remedy any defects that may exist as soon as they occur. There is no harm in using a simple antiseptic or one of the several excellent toothpastes incorporating a mild antiseptic which are to be found on the market.

The main point in the hygiene of the mouth is to cleanse the teeth after every meal. A

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fairly good substitute for this is a thorough brushing at night and one in the morning. The character of the brush is all important. It should be neither too large nor too small, and the bristles should be firm. The brushing so often done transversely to the long axis of the teeth is not nearly so efficient as the up and down movement by which the particles of food are removed from between the teeth. It is needless to say that the average tooth-brush is kept in active service too long. As soon as the bristles are softened a new one should be purchased. It would not be too much to say that the average brush should not remain in service longer than one month. With care such as this the services of the dentist would be rather infrequently required, and that common disease gingivitis or pyorrhea alveolaris would become far less frequent. It is possible that systemic conditions such as diabetes and gout predispose to inflammation of the gums, and that no amount of care would wholly prevent inflammations of the gums and loosening of the teeth, but it is certain that a strict cleanliness of the mouth and teeth would do away with nine-tenths of the caries, gingivitis, and other troubles of the teeth, and the great liability of constitutional infection and digestive disturbance from this source.

SOME TRUTHS ABOUT SLEEP.

Norman Bridge, in an illuminating article in the *Journal of the American Medical Association* of September 1, 1906, refers to the dissimilar views as to the quantity of sleep required. Some hold to the opinion that four or five hours is sufficient, while others insist that eight or nine in the twenty-four should be obtained. The medical profession quite generally holds to the latter view, and especially insists that children should have an abundance of sleep. He claims that the common notion regarding insomnia is erroneous, and that this furnishes a rich harvest field for the exploiter of nostrums. He admits the possibility that drugs may be useful in insomnia, but thinks that the weight of evidence is rather against their being of any service, and that in most cases when self-administered they can do nothing but harm. Much of this self-drugging arises out of the horror of sleeplessness and its supposed injuriousness, which has led to a certain insomniphobia. Many of the bad symptoms which patients have are attributed to a want of sleep. Such patients if they can be taught to avoid fretting will find that their insomnia is not harmful. If such a sufferer can be taught to go to bed convinced that he does not wish to sleep—in other words, secure a certain amount of pleasure in being awake—he will often fall asleep before he knows it, and probably so remain during the night. The chief thing is the pleasurable mood, or lacking that a stoical indifference as to whether sleep comes or not.

An important truth regarding insomnia that has been too much neglected is that the purpose of going to bed and remaining there eight or ten hours is to rest, not necessarily to sleep. The thing is easily resolved into a cultivation of a proper mental attitude, but this is one of the most difficult things for the insomniac, who is chagrined if he does not drop off to sleep promptly on going to bed, and if awakened before daylight he frets until rising time. It is difficult to unlearn the lessons of a lifetime, which instil the classical eight hours of sleep. It is notorious that people who lie abed long hours reading and sleep correspondingly little live as long and have as good health as the average. Many eminent men of history have slept little, and hardly one can be called an intellectual giant who has been accustomed to a great amount of sleep. The common notion that it is necessary to exercise until a late hour

in order to tire the body so that sleep may come, or to rise at an absurd hour because of wakefulness, is a mistake. The body must be well rested every day and in the horizontal posture. If enough rest is obtained and worry does not prevent it, sleep will usually come, and will be in amount sufficient for the needs. While the common notions regarding insomnia are erroneous, and it is not essential that a person should sleep as much as is usually supposed, none of the common aids to slumber should be neglected. The shutting out of noises, a comfortable bed, and other physical conditions are conducive to sleep and should not be neglected.

On the whole Dr. Bridge's paper deals so carefully with one phase of modern nervousness that its truths should be impressed upon every practitioner who has the care and management of nervous cases.

AN ENUMERATION OF THE TUBERCULOUS.

It is announced that the Kansas State Board of Health has determined to take a census of the tuberculous population of the State with the idea of furthering the antituberculous propaganda. For this purpose a blank is to be sent to each physician of the State, who is to be asked to report upon all cases of tuberculosis under his care. That such methods will secure anything like an accurate count of the cases of tuberculosis in the State can hardly be hoped for. It will certainly not secure an account of those incipient and early cases which are generally diagnosticated as a cold and are given an expectorant. Hence the probability of individual benefit to tuberculous cases by such a census is remote. It may be helpful in limiting infection from advanced cases, which certainly should be more or less under the direction of the public health authorities, particularly the poorer patients, whose hygienic surroundings make them especially dangerous.

THE CASE OF ALBERT T. PATRICK.

Perhaps no case of recent years has attracted more attention than the trial of Albert T. Patrick for the murder of William M. Rice. The long period which Patrick has been in jail, the greater portion of which time he has been awaiting the execution of the death penalty, has furnished many dramatic incidents. There is grave doubt in the minds of many physicians both in New York City and in the State at large as to the sufficiency of the evidence by which Patrick was convicted. A petition has been extensively signed addressed to the governor requesting him to appoint a commission to examine into the questions. The *Boston Medical and Surgical Journal* of August 23, 1906, reviews the main facts in regard to the death of Mr. Rice, who was 84 years of age, which was attributed entirely to natural causes by Dr. Walker Curry, his physician, who examined the body half an hour after death and did not detect any odor of chloroform, although the deceased wore a beard. (Dr. Curry, since dead, was a highly esteemed regular practitioner, and had attended the patient consecutively for eight months.) Within two hours after death the body of Mr. Rice was embalmed with "Falcon embalming fluid," which contains formaldehyde gas in solution, and in connection with this process no blood whatever was withdrawn. The autopsy, performed by Dr. E. J. Donlin, coroner's physician, was not made until forty-one hours later. The autopsy record of the examination of the lungs was as follows: "Left lung congested and edematous. Right lung same, and a small area of consolidated lung tissue about the size of a 25-cent piece in lower lobe." The lungs were not preserved for more minute examination, as were some of the other organs, but were cremated with the great mass of the body.

At Patrick's trial the contention of the prosecution was that the death resulted from the

administration of chloroform, and this was based largely on the condition of the lungs noted at the autopsy. The essential propositions over which the conflict of medical testimony occurred were as follows: (1) That active congestion of the lungs coextensive with the lungs can be caused by the inhalation of an irritant gas or vapor, and by nothing else. (2) That the vapor of chloroform is one capable of causing such active coextensive congestion. (3) That in death by chloroform the lungs are "invariably congested, and that with a congestion coextensive with the lungs themselves." (Elsewhere particular stress is laid upon the fact that the congestion is *active*.) (4) That, notwithstanding the intensely irritant character of the fumes of chloroform, as asserted above, a cone made with a towel in which was inserted a sponge, upon which about two ounces of chloroform had been poured, could be placed on a sleeping man's face without awakening him, and could be left there unsupported for over half an hour without exciting sufficient spasmodic irritation of the glottis to dislodge it; so that at the end of that time the cone was found where it was originally placed, the subject having neither awakened nor moved, although during that period of half an hour the chloroform was exerting its alleged irritant action so powerfully as to cause "active congestion of the lungs coextensive with the lungs themselves." The jury, without considering at all the question whether the apparent pulmonary congestion noted might not have been caused by the embalming fluid employed shortly after death, rendered a verdict of guilty.

As to how far chloroform inhalation acts as an irritant to the respiratory passages, it may be stated that out of 310 recorded autopsies in cases of death from chloroform, congestion of the lungs was mentioned as being present in but 69 instances, while in 41 of those the congestion was distinctly stated to be passive. In 25 other cases it is shown to have been passive, either by direct statement of the character of the blood or by the general association of the pulmonary congestion with venous congestion of other organs. In three cases only was the congestion stated to be active, and in two of these there had been preëxisting bronchitis, while in the third the congestion is definitely described as partial. In connection with the 588 experiments on animals made by the Hyderabad Commission, 42 autopsies were held. Of these, the lungs were recorded as normal in 20; healthy in 5; nothing is stated about them in 15; in one they are described as "dry, not crepitant," and in one as "engorged," though in this last the character of the blood is stated to have been venous. Ever since Patrick's trial, however, there has existed in the public mind a very considerable amount of doubt as to whether chloroform was actually administered to the deceased at all. This is owing to the very unreliable character of Jones, the valet of Mr. Rice, who, after previously making two or three totally different and contradictory statements, turned State's evidence and testified at the trial that he did the chloroforming for Patrick in the manner described above. One of Jones's statements in the witness-box was to the effect that the application of a lighted match to the towel containing about two ounces of chloroform was followed by a "burning up quickly, like oil." The absurdity of this was afterward shown by a committee of the Medicolegal Society (mention of which is made below), whose members found by experiment that it required over fifty minutes to consume a towel thus saturated.

When the motion for a new trial (which was later decided adversely by the court) was argued before Recorder Goff, who was the judge under whom Patrick was tried and convicted, the principal point raised was as to

whether such a solution as the "Falcon" embalming fluid, employed shortly after death and in the manner used by the professional embalmer in the Rice case, is capable of producing congestion, or apparent congestion, of the lungs in the cadaver. A certain number of medical experts employed by the prosecution testified (backing up their assertions by reports of actual experiments made by them) that such a thing is impossible, and a certain number of other experts employed by the prosecution, also backing up their assertions by the reports of experiments, testified to the opposite. In this connection it is interesting to note that in view of the special interest of the case the Medicolegal Society some time ago appointed a select committee of experts to make a thorough investigation and give an opinion upon the medicolegal points involved in it. One of the questions put to the committee was as to whether the embalming of a human body by the arterial process with the "Falcon" solution, two hours after death and before rigor mortis had set in, as described by the witness in this case, would produce congestion of the lungs. The answer to this in the report of the committee, which presented the conclusions reached after much research, as well as a careful reading of the mass of evidence given at the trial, was as follows: "The embalming fluid could not produce a congestion of the lungs, or any part of the body, because a true congestion is a condition found only as a result of disease or injury occurring in a living person. But the condition found, after embalming, to the ordinary observer or to the naked eye is so like a true congestion that a microscopical or bacteriological examination would be required to distinguish between them. Therefore the answer to this question would be, 'Yes.'" One of the members of this committee, it is worthy of mention, was Howard S. Eckles, of Philadelphia, who during the years 1895 and 1896 studied anatomy with special reference to the circulation of the blood and the art and science of embalming, and who for the last ten years has been a practical embalmer and well-known instructor in embalming.

The *Journal* points out that the medical evidence cannot be reviewed by the United States Supreme Court before which the appeal is now pending, but that it is within the province of Governor Higgins to appoint a commission of experts to review the evidence adduced at the trial.

DEATH OF A CENTENARIAN.

Attention is called by the lay press to the death of Timothy Dillon, a resident of New Rochelle, Westchester county, New York, whose death occurred shortly after he had passed his 100th year. Incidentally attention is called to the fact that he was a quite famous pedestrian and that within a couple of days of his death he was accustomed to take a four mile walk daily. It is related of him that he walked twice a week to New York to attend religious services, there being no Roman Catholic church in his own town. This was prior to the time when New Rochelle had special transportation to New York. These facts call attention to the value of walking as a means of exercise. In the twenty years following Weston's famous walk from New York to Chicago there was quite a revival of pedestrianism. The advent of the bicycle threw this form of exercise into disuse, substituting for it a rather agreeable form of exercise. The bicycle has largely been replaced by the automobile, which is a form of exercise that is about the worst that can be devised. It combines great nervous strain, the practical disuse of the legs and very little use of the upper part of the body, with a maximum inhalation of dust and bad odors and a degree of passive

violence to the spinal column and the nervous system that is scarcely equaled by any other form of sport. It is to be hoped that there may be a revival of pedestrianism as a form of exercise available for every one, which generally takes one into pleasant paths and which is altogether worthy of cultivation. Many may not as a result carry their years beyond the century mark, but they will certainly secure much health and strength by the persistent employment of this form of exercise.

DEDICATION OF THE NEW BUILDINGS OF THE HARVARD MEDICAL SCHOOL.

The casual visitor cannot fail to be impressed with the new Harvard Medical School buildings. The two columns of marble buildings rising on each side of the sloping terrace form the most imposing structures devoted to medical teaching in the world. On September 25 last they were dedicated with imposing ceremonies in the presence of a large concourse of distinguished visitors from many of the great universities of the world. It was an occasion of felicitation, and on the same day many honorary degrees were conferred on representative medical men and others.

To those who have seen these buildings but little need be said of their grandeur and magnificence, but to the thoughtful there will come a feeling of sadness at the enormous waste of money in such an erroneous pile of marble and iron. The cost of these structures was upwards of $5,000,000, which if capitalized at 4 per cent represents an interest charge of over $200,000. If we add to this the very large sum required for the maintenance of such a large and expensive structure, probably not less than $100,000 per annum during a period of 20 years, we shall have a total outlay of nearly $300,000 a year just for the plant. If such an enormous sum were essential for medical teaching, or indeed necessary facilities could not be obtained in any other way, there would be little hesitation in approving of such enormous cost. Equal results could have been obtained in far less expensive structures. Equally convenient and quite as satisfactory buildings for the purpose could have been erected for less than one-fifth of this sum, and the remainder could have been used for an endowment which would have been far more efficient in forwarding the work of medical teaching at Harvard than will these vast masses of marble and iron. We feel disposed to congratulate the Harvard Medical School on its magnificent housing, but cannot help feeling a sense of regret at the wastefulness of it all.

A RESPONSIBLE LUNATIC.

An application was recently made by a citizen of Boyle county, Kentucky, to be sent to an asylum for the insane. He was placed on trial before a jury in the county court and they found him insane, evidently largely upon his own confession that he had distinct impulses to kill his wife and children, burn his house, and then destroy himself. These impulses were so strong that he feared he would be unable to resist them, and he accordingly made the application to the court, who promptly granted his request and committed him to an asylum. The report does not say whether he delivered himself to the asylum authorities, or whether he was then and there taken by the sheriff in custody and so sent rejoicing on his legal way. He manifested great joy in the fact that he was to be restrained in such a way that his wife and children would be free from danger. Such a case as this raises the question of accountability, particularly as to the right and wrong test. If this man had destroyed his children he would have been legally accountable under certain applications of the right and wrong test, which holds that if a man knows the nature and quality of the act

and knows that it is wrong, then he is to be punished. There can be little doubt that this individual knew what he was doing, and knew that he had the further capacity to put himself into a situation in which he could do no harm. The fact that he did recognize the act as wrong and did place himself under a situation to resist it shows according to the legal dictum that he was perfectly rational, hence the action of the Boyle County Court in committing the man to the asylum who was sane and rational was certainly a gross miscarriage of justice, though it apparently saved the lives of some inoffensive individuals. We who have always looked upon the law as the highest expression of logic applied to human affairs cannot help being a little confused by these legal rules, but we know that they must be all right, for it is the law.

TREATMENT OF ASCITES SECONDARY TO CHRONIC HEPATITIS.

Before the section on surgery of the British Medical Association, Sinclair White read an interesting paper on the surgical treatment of cirrhosis of the liver. By the latter term he understood a vascular cirrhosis, the most obvious symptoms of which were hemorrhages from the alimentary tract and ascites. Fifty per cent of cases of cirrhosis of the liver pass to a fatal termination without ascites, its absence being explained by enlargement of the normal anastomotic vessels connecting the system and portal veins and the development of new anastomoses in adhesions formed by the viscera. The value of drainage associated with epiplopexy was unquestioned. The operation should in all cases be preceded by one or more tappings. The details of the operation vary, but in all cases omental fixation was a most important step. Turner of New Castle, speaking for Morrison and Drummond, who as early as 1894 introduced the Talma operation to the English-speaking world, reported 16 cases operated in that city. There were five immediately fatal cases, but these were not properly selected. The successful cases were those of alcoholic cirrhosis with ascites not complicated by cardiac, pulmonary, or renal lesions, and those which have survived one or more tappings. Among these selected cases three patients were alive and well seven years and five months, twelve months, and seven months after operation, and two lived in good health for five years and two years respectively. In formulating the indications for Talma's operation it was important to know that the ascites was due to portal obstruction and not to toxemia; rapid wasting, slight jaundice, and early edema of the legs were bad signs. In all cases the patients should have survived several tappings, which in itself might cure the condition as it tended to produce adhesions. Pulmonary, cardiac or renal complications are distinct contraindications. The non-alcoholic and syphilitic cases do badly. Cameron emphasized the value of drainage and particularly free tapping as affording relief in ascitic cases.

PROFESSOR BROUARDEL.

Perhaps the greatest name in the annals of forensic medicine is that of Tardieu, who in 1879 was succeeded by Professor Brouardel in the chair of legal medicine at Paris. From that time on Brouardel has been one of the leaders of the French profession, having been for fourteen years dean of the medical faculty at Paris and the official representative at most of the leading congresses for many years past. After an early career during which he produced numerous studies in pathology, he shortly before the death of Tardieu became his assistant. From that time on his interest in legal medicine never flagged, and the school of instruction which he maintained in the Paris morgue was one of the leading institutions for forensic medicine in the world. In

the decade following his appointment to the chair of forensic medicine he contributed many papers on medicolegal topics which were of striking value. Later on he became interested in public hygiene. No medical man of this generation in France has been so universally respected and so bold a leader, and one who has exercised such an important influence for the good of the profession. He was a man of prodigious activity, which he did not abate until a diabetes showed itself, and later a tuberculous laryngitis, probably aggravated by his persistent work in the unsanitary surroundings of the Paris morgue, finally terminated his career.

DEATH OF DR. FRITZ SCHAUDINN.

There is a striking similarity between the deaths of Schaudinn and Dr. Walter Reed. The end came to both these remarkable investigators very soon after their epoch-making discoveries. Schaudinn's occurred early last summer, scarcely more than a year after his announcement of the discovery of the spirochæta pallida. There has been no discovery quite so universally accepted in which the crucial tests of cultivation and inoculation have not been made. As a discoverer of the organism of syphilis his name deserves to rank as high as that of Pasteur, Koch, and others who have done so much to unravel the mystery of contagious disorders. At the time of his death he was in his 33d year, and, like many others who devote their attention to scientific pursuits, he practically left his family penniless. There is a movement on foot in Germany, which has been widely seconded in England, to collect a memorial fund, the income of which shall go to the support of his family. It is to be hoped that the request for funds for this laudable purpose will meet with a wide and generous response.

RHYTHMIC LATERAL DISPLACEMENT OF THE HEART IN UNILATERAL PLEURITIC EXUDATE.

The difficulty of distinguishing some cases of effusion in the chest lends emphasis to the claim of Greene (*American Journal of the Medical Sciences,* March, 1906) that there is a lateral rhythmic displacement of the heart in unilateral effusions. It is associated with respiration, the heart moving upward and approaching the affected side with each inspiration. In bulky effusions with considerable tension the movement is less than in effusions of moderate extent. The movement of the heart in respiration may be recognized by any of the ordinary means, such as percussion or auscultation or with the fluoroscope. The writer claims never to have seen a case of unilateral effusion in which this lateral movement of the heart was not present. Deep breathing and forced expiration are essential to its detection.

THE EPIDEMIOLOGY OF PLAGUE.

Accumulating knowledge of the plague, particularly the very careful studies that have been made in Japan and Australia, confirm the view that the main factor in the spread of plague is the rat, and from the latter animal the disease is conveyed to man by an intermediary host, probably the flea. J. A. Thompson in a recent address at the Boston meeting of the American Medical Association (*Australasian Medical Gazette,* August 20, 1906) says that a living intermediary host is the only explanation that accounts for all of the facts in the spread of plague and excludes every other reasonable explanation. While the true experimental proof is lacking, he believes that it will ultimately be supplied. The assumption that the flea is the carrier of plague explains all of the observed facts in the Australian epidemic, and seemingly quite contradictory results are harmonized.

ORIGINAL ARTICLES.

SOME AIDS IN TEACHING CLIMATOLOGY AND CLIMATOTHERAPY.[1]

BY GUY HINSDALE, A.M., M.D., HOT SPRINGS, VIRGINIA,

Secretary American Climatological Association, Vice-president American Academy of Medicine, Lecturer on Climatology, Medico-Chirurgical College, Philadelphia, Fellow of the College of Physicians of Philadelphia, etc.

Few medical schools in this country give any instruction in climatology. It is true that climatic treatment is mentioned and advocated as various diseases are discussed; but the terms employed are so vague that students do not gain definite information as to what constitutes "a suitable climate," casually mentioned, perhaps, as desirable for a case of Bright's disease, hay-fever, or rheumatism. Special lectures on climatology are delivered in Cornell University Medical School, New York, by Dr. H. P. Loomis, in Bellevue by Dr. Lefevre, in McGill by Dr. Blackader, and in Jefferson by Dr. Hare.[2]

In Jefferson Medical College and in the University of Pennsylvania the professors of practice and therapeutics lay considerable stress on the proper use of climates; but Prof. Wilson believes that it is necessary to recognize a postgraduate year which will enable the curriculum to be extended so as to include such departments. He does not see how proper time can be given to the subject in a four years' course. Undoubtedly physiologic therapeutics has been too long neglected, and to-day we see a strong demand for natural agencies, and we recognize them as more powerful aids than most of our drugs. Such an important subject merits a place in any four years' course.

The difficulty in teaching it lies in the largeness of the subject, not in any want of interest on the part of the students. The climatic influence is a strong one, and one should know how it affects the organism. To understand its effects the general principles of meteorology as applied to climate must be made clear; and of the lectures which the author delivered at the Medico-Chirurgical College last winter, two were devoted to this fundamental portion of the subject.

In these two lectures the following works on climatology were exhibited: Solly's Handbook of Climatology;[1] Hahn's Climatology, translated by Ward;[2] Huggard's Hand-book of Climatic Treatment;[3] Aerotherapy,[3] by Charles Theodore Williams, of London; the twenty-one volumes of the Transactions of the American Climatological Association; and the third and fourth volumes of A System of Physiologic Therapeutics, edited by S. Solis-Cohen, and written by Dr. F. Parkes Weber, of London, and by the author.[4]

Various meteorologic instruments were exhibited and explained—*e.g.*, thermometers, barometers, the hygrodeik with dry and wet bulb thermometers and scales for noting the relative humidity. The work of the U. S. Weather Bureau was described and the weather maps were explained. This leads to the subject of atmospheric pressure and the presence of areas of high and low barometer and their tracks across the continent. Cyclones and hurricanes were explained and the differences between them and tornadoes. Next

[1]Read at the meeting of the Pennsylvania State Medical Society, at Bedford Springs, September 11-13, 1906.

[2]An excellent course of instruction in meteorology and climatology is offered as an elective in Harvard University, by Prof. R. DeCourcey Ward.

[1]Lea Bros. & Co.

[2]Macmillan.

[3]*Ibid.*

[4]P. Blakiston's Son & Co.

the course of winds with references to cyclones and anti-cyclones; temperature and the occurrence of cold waves and hot waves; humidity, absolute and relative, its effect on the human subject being briefly noted.

In the second lecture the change in barometric pressure during the few days' interval was noted, and by the daily weather maps the changes in the weather were explained. This immediately interests the student, who will be stimulated to make some observations for himself so as to know what is going on in the climatic world. A few minutes devoted to the study of instruments other than the ordinary hospital paraphernalia serves to widen his horizon and may plant in the student's mind something that will broaden his field of thought and give him an added interest in climatotherapy.

The second lecture is devoted to the physiologic effects of heat, cold, and humidity; the effect of sunlight, altitude, and the influence of various soils and the configuration of the earth's surface on its inhabitants.

A third lecture is devoted to the effect of climate on tuberculosis; a fourth, to the treatment of bronchitis, Bright's disease, heart disease, rheumatism, gout, hay-fever, and nervous diseases such as neurasthenia, hypochondria, etc., by means of properly selected climates.

Any one who is interested in teaching climatology will find a valuable aid in the use of lantern slides. Over three hundred different slides illustrating meteorology are now obtainable through the Geographic Society of Chicago at a very moderate price, and in this way students can see what all the standard government instruments and records look like.

By means of charts showing the facts relating to air pressure and circulation, temperature, sunshine and cloud, humidity and precipitation, thunder-storms and tornadoes, the effect of lightning and floods, and some typical localities, it is possible to illustrate the subjects quickly and in this manner engage the eye as well as the ear. As it is important to leave something tangible in the student's hands for reference, I have prepared a classification of American health resorts on a therapeutic basis. It is an attempt to suggest places that, by personal observation or the testimony of others, have some reasonable claim as suitable for the various affections noted. This can be used as a memorandum for future use and is herewith appended.

Another aid is to have a single lecture, as for instance on climates and health resorts for the benefit of tuberculosis, printed for distribution, so that this very large subject need not consume too great a proportion of the time devoted to the course. This also serves to leave with the student some tangible expression of the teacher's views.

In order to teach one must first learn, and familiarity with various climates and health resorts is best acquired by personal observation. We cannot visit all the health resorts or have personal knowledge of all the climates we may recommend. This lack of personal knowledge of course leads to frequent disappointment. In France they have instituted yearly medical journeys of two weeks duration in which physicians participate and thus familiarize themselves with various spas and health stations in some special section of the country. These medical journeys are growing in popularity, and are inexpensive, as naturally it is a decided advantage to the resort to have a visit from a body of physicians, whose tour of inspection cannot fail to add to the reputation and prosperity of the places included in the itinerary.[1]

The Medical Society of the State of Pennsylvania has made a step in the right direction

[1]The Voyages d'Etudes Medicales have been conducted successfully for seven years. They occupy two weeks in September and the total expense is about 350 francs. The number of participants is now limited to 100. Prof. Landouzy, of Paris, acts as guide. These delightful trips are managed by Dr. Carron de Carrière, 2 Rue Lincoln, Paris. The trip in 1907 will afford a visit to Vittel, Contrexéville, Martigny, Bourbonne-les-Bains, Plombières, and other stations in Northeastern France.

in visiting its most famous spa, and I have no doubt, if little tours to health resorts could be organized under the auspices of some responsible body, annual visitations of great value to physicians would become quite as popular here as abroad.

In New York State it would be possible in a fortnight to visit such representative places as Saratoga Springs, Lake George, the sanatoria at Saranac Lake, Lake Kushaqua, and Ray Brook in the Adirondack Mountains, Sharon Springs, Richfield Springs, and the Loomis Sanatorium at Liberty. A similar trip in the South might include Virginia Hot Springs, Warm Springs, Healing Springs, Rockbridge Alum Springs, White Sulphur Springs, West Virginia, and other more or less famous resorts. The sanatoria for consumptives at Rutland, Sharon, and East Bridgewater, Massachusetts, and North Scituate, Rhode Island, might be brought into another group.

Of course it would be necessary to arrange for demonstrations of the special climatic features and therapeutic methods pertaining to each place by qualified medical men, and it would no doubt be of great interest to the visitors and a corresponding stimulus to the local men who represent the medical side of the various resorts and spas. For various reasons at many of our American resorts the financial management and the purely medical administration are not so closely allied as might seem desirable. Undoubtedly the European method of State control cannot be carried out so well in this country. In the United States so far as I know the only resorts where the United States Government exercises any control are the Hot Springs, Arkansas, and the sanatoria for tuberculous soldiers of the United States Army at Fort Bayard and the United States Public Health and Marine Hospital Service sanatorium at Fort Stanton, New Mexico.

The whole subject, which I have briefly outlined, may then be presented in a practical and interesting manner by the use of the "Case System." A brief statement of the patient's history, the diagnosis of the case, and the personal features and conditions are given, and a student is selected to advise climatic treatment. This advice for the particular patients, whether rich or poor, may then be discussed, and various opinions expressed by students may be brought to some practical conclusion. Typical cases should be chosen, and, whether real or imaginary, the main points should be noted on the blackboard. This method, so successfully used by Cabot, Cannon, Osler, Stengel, and others in general medicine, has a particularly useful place in teaching climatotherapy.

THERAPEUTIC CLASSIFICATION OF AMERICAN HEALTH RESORTS.

Pulmonary Tuberculosis.—Gravenhurst, Ontario; Lahl Ghur, Ste. Agathe, Quebec; Long Lake, Gabriels, Ray Brook, Saranac Lake, Paul Smith's, Lake Kushaqua, N. Y.; Liberty, N. Y.; Rutland, Mass.; Sharon, Mass.; East Bridgewater, Mass.; New Canaan, Ct.; South Scituate, R. I.; Hammonton, Vineland, N. J.; Kane, Glen Summit, Pocono, Mont Alto, White Haven, Pa.; Asheville, N. C.; Southern Pines, N. C.; Aiken, Camden, S. C.; Thomasville and Summerville, Ga.; Palatka, Enterprise, Fla.; San Antonio, Boerne, El Paso, and Western Texas; Santa Fe, Las Cruces, Las Vegas, Hot Springs, Chico Springs, Fort Bayard, Fort Stanton, Silver City, and Albuquerque, New Mexico; Colorado Springs, Denver, Estes Park, Canon City, Boulder, Colo.; Phoenix, Tucson, Tempe, and Prescott, Ariz.; the interior resorts of Southern California, such as Redlands, Riverside, Indio, and Idyllwild, near San Jacinto Mt., Monrovia, Pasadena, Mentone, Esperanza, Altadena, Santa Barbara, San Diego; in summer the Rocky Mountains of Idaho, Montana, and British Columbia. In cases complicated with kidney disease, and in any advanced stage, high altitudes should be avoided, but hemorrhage is not a counter-indication.

Tubercular Laryngitis.—Interior of Florida and Southern California; Colorado Springs.

Chronic Fibroid Phthisis.—The interior Florida resorts in winter; the sand belt of Georgia, South Carolina, and North Carolina. The coast resorts of the southern Atlantic seaboard, including Atlantic City, are suitable for selected cases.

Chronic Catarrh of the Pharynx, Larynx, and Nose.—Summer: The Long Island and Massachusetts coast;

the interior resorts of Maine, Moosehead Lake, Rangeley Lakes, Poland Springs; the White Mountains of New Hampshire; the Adirondacks, N. Y.; Pocono Mountains, Eagles Mere, Kane, Pa.; the Virginia Springs, the mountains of West Virginia and North Carolina; the southern coast of California, San Diego, Coronado, Santa Barbara; Castle Hot Springs, Arizona; Honolulu, Nassau.

Hay Fever.—The highlands of Ontario, comprising the Muskoka Lakes, the Lake of Bays, the Magnetawang district, Penetang, Midland, Honey Harbor, Georgian Bay, and Kawartha Lakes; Port Arthur and the neighborhood of Thunder Bay, Lake Superior; Yarmouth, Digby, Nova Scotia; Cape Breton; Charlottetown, Prince Edward Island; St. Andrews, Dalhousie, Campobello, New Brunswick; Bar Harbor, North Haven, Isle au Haut, Katahdin Iron Works, Moosehead Lake and Rangeley Lakes, Maine; Bethlehem, Maplewood, Profile, Twin Mountain, Mount Pleasant, Fabyan's, Crawford, Jefferson, Dixville Notch, N. H.; the Isles of Shoals, N. H.; Baker Island, Block Island, Nantucket, Mass.; the higher Adirondack resorts, *e. g.,* Undercliff, Ruisseaumont and Whiteface, Lake Placid; Ampersand, Saranac Lake; Paul Smith's, Blue Mountain Lake, Raquette Lake and Loon Lake; Beach Haven, N. J.; Put-in-Bay, Ohio; Marquette, Sault Ste. Marie, Mackinac, Mich.; Coronado Beach, Catalina Island, Cal.

Asthma, the Neurotic or Spasmodic Form.—Elevated sunny regions, *e. g.,* Colorado Springs, Manitou, Glenwood Springs, Colo.; Castle Hot Springs, Ariz.; Hot Springs, Va.; Lake Placid, N. Y.; the White Mountains, N. H.; Kane, Pa.; Lakewood, N. J. The higher elevations are counter-indicated in aged persons.

Chronic Digestive Disorders, Including Constipation.—The saline mineral springs, including Saratoga and Richfield Springs, N. Y.; Cambridge Springs and Bedford Springs, Pa.; White Sulphur Springs, W. Va.; Napa Soda Springs and Summit Soda Springs, Cal.; Ouray, Springdale Seltzer and Manitou Springs, Colo.; Wilhoit Springs, Ore.

Catarrhal Disease of the Intestine.—Rockbridge Alum Springs, Va., in summer; Saratoga and Richfield Springs, N. Y.

Chronic Alcoholism.—French Lick Springs, Ind.; Bedford Springs, Pa. (summer only).

Chronic Malarial Affections.—Newport, Narragansett, R. I.; Cape Cod and the north shore of Massachusetts; the Maine coast and interior resorts; Nova Scotia, Cape Breton, the Thousand Islands of the St. Lawrence; Mackinac, Mich.; the interior Canadian resorts, including Muskoka Lake region, Georgian Bay and Lake Superior; Banff, Alberta, Laggan and Glacier, B. C.; the coast resorts of California.

Chronic Articular Rheumatism.—Hot Springs of Virginia, North Carolina, Arkansas, South Dakota, and Mt. Clemens, Mich.; Indian Mud Springs, Klamath Mud Springs, and Hot Mud Springs, Siskyou Co., Cal.; Paso Robles, Redlands, Riverside, Arrowhead Hot Springs, San Diego, Coronado, Cal.; Tucson, Castle Hot Springs, and Phoenix, Ariz.

Gout and Gouty Conditions.—Dry inland resorts: Hot Springs, Virginia and North Carolina; Mt. Clemens, Mich.; Lakewood, N. J.; Pinehurst, N. C.; Bedford Springs, Pa.; Poland Springs, Maine; Richfield, Sharon, Clifton, and Saratoga Springs, N. Y.; Caledonia and St. Leon Springs, Ontario; Banff Hot Springs, Alberta, Canada (summer only).

Heart Diseases.—The coast resorts generally: Glen Springs, N. Y. (summer only); Lake George, the Thousand Islands; Put-in-Bay, Lake Erie; Mackinac, Mich.

Affections of the Liver and Bile Ducts.—Bedford Springs, Pa.; Sharon, Richfield, and Clifton Springs, N. Y.; Saratoga, N. Y.; Waukesha, Wis.; Mt. Clemens, Mich.; Calistoga Springs, Cal.; French Lick Springs, Ind.

Bright's Disease.—In the winter the Florida coast resorts; Brunswick and Thomasville, Ga.; Aiken, Camden, and Summerville, S. C.; Southern Pines, Pinehurst, Wilmington, N. C.; Hot Springs, Old Point Comfort, Va.; Atlantic City, Cape May, Lakewood, N. J.; Castle Hot Springs, Arizona. In summer, Poland Springs, Me.; Healing Springs, Va.; Long Island resorts, N. Y.; Coronado and San Diego, Cal.; Honolulu, at all seasons. Cool, stimulating climates should be avoided.

Diabetes Mellitus.—Palm Beach, Miami, St. Augustine, Ormond, and other Florida resorts; Aiken, S. C.; Thomasville, Ga.; Cape May, Atlantic City, N. J.; Lakewood, Hammonton, N. J.; Hot Springs, Virginia Beach, and Old Point Comfort, Va.; Coronado, Pasadena, San Diego, Redlands, Santa Barbara, Cal.; Clifton Springs, N. Y.; Nassau in winter.

Hysteria; After-treatment.—The coast resorts of the Atlantic and Pacific; in summer the mountains of New Hampshire, New York, and Virginia. The tonic climate of Maine is especially suitable. (See under "Neurasthenia.")

Neurasthenia.—The camps of the Adirondack Mountains, N. Y., of Maine and Canada, are especially suitable for men and selected cases among women; Deer Park and Oakland, Md.; Hot Springs, Va.; the quieter resorts of New Jersey, such as Lakewood, Cape May, Ocean City, Spring Lake, Atlantic City, except in summer; the resorts of Long Island, especially Easthampton, Shelter Island, Quogue, and Patchogue; Nantucket, Cape Cod, Newport, Marblehead, Manchester-by-the-Sea, Magnolia, Gloucester, Cape Ann; Rye Beach, Portsmouth, N. H.; Kineo, Me.; York Harbor, Kennebunkport, Kennebunk Beach, and the islands about Portland, Maine. Mount Desert and Islesboro are also well suited for the summer treatment of neurasthenia. Paso Robles and Del Monte, Cal.; the Canadian Rocky Mountain resorts, Banff Hot Springs, Field, Laggan,

Glacier, etc., are suitable for July, August, and September. High altitudes should be avoided for prolonged residence.

Neuralgia.—White Sulphur Springs and Capon Springs, W. Va.; Hot Springs, Va.; Saratoga and Clifton Springs, N. Y.; Portland, Ore.; Castle Hot Springs, Ariz.; Arrowhead, Cal.

Anemia and General Debility.—Tonic inland climates, such as the White Mountains of New Hampshire; the Adirondacks, N. Y.; Lake Mohonk, N. Y.; the mountains of Virginia; White Sulphur Springs, W. Va.; Hot Springs, Va.; Sharon, Richfield, Crab Orchard, and Oak Orchard Springs, N. Y.; Colorado Springs, Glenwood Springs, Manitou, Colo.; Paso Robles, New Almaden, Vichy, Congress Spring and Napa Soda Spring, in California; the Maine coast and Long Island coast in summer; Castle Hot Springs, Ariz.; Arrowhead, Cal.

The Feebleness of Age.—In winter the Florida resorts; Thomasville, Ga.; Aiken, Summerville, North Augusta, and Camden, S. C.; Pinehurst, N. C.; Old Point Comfort, Va.; Cape May, Atlantic City, Spring Lake, Long Branch, Hammonton, Lakewood, N. J. In summer, the New Jersey coast, Long Island, Cape Cod, Nantucket, Martha's Vineyard, Newport, and Narragansett, R. I.; Rye Beach, Portsmouth, and New Castle, N. H.; the Maine coast; Rangeley Lakes, White Mountains, Lake George and Lake Champlain, Westport, Elizabethtown, Keene Valley, N. Y.; Saratoga Springs, Clifton Springs, Lake Mohonk, Chautauqua Lake, N. Y.; Put-in-Bay, Ohio; Lake Minnetonka, Minn.; Coronado, San Diego, Pasadena, Santa Barbara, Redlands, Riverside, Miramonte, Monterey, Santa Cruz, Cal.

Skin Diseases.—Hot Springs, Ark.; Hot Springs, Va.; in summer, Warm Springs and Healing Springs, Va.; Richfield Springs, Sharon Springs, N. Y.; Indian Mud Springs, Klamath Mud Springs, Byron Springs, Cal.; Glenwood Springs, Colo.

Syphilis.—Hot Springs, Ark.; Hot Springs, S. D.; Mt. Clemens, Mich.; Banff, Canada.

Chronic Metallic Poisoning.—Richfield Springs, N. Y.; Bedford Springs, Pa.; Glenwood Springs, Colo.; Hot Springs, Va.; Hot Springs, S. D.; Arrowhead, Coronado, Paso Robles, Cal.; Sitka Hot Springs, Alaska; Halcyon Springs, Arrow Lake, B. C.

ELECTIVES IN THE MEDICAL COURSE AND PREPARATION FOR SPECIALISM.

BY A. L. BENEDICT, A.M., M.D.,

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Within the last generation there has been a decided change of medical opinion with regard to specialism. The earliest specialists were mainly quacks, and until quite recently the code of ethics of the profession has condemned anything that could be construed as a claim of superior knowledge on the part of any member. At the beginning of his limitation of practice the specialist may modestly say that he claims no superior skill or experience, but that his specialization is purely a matter of business convenience. But in course of time, and at least as early as he begins to receive recognition as a specialist, there develops a conflict between a modest conformity with the old letter of the code and common sense or even honesty. However unassuming the personality and the professional methods of the specialist, the mere fact of specialization is an implicit claim of superior skill and experience. If, in all candor, at the end of five years of effort concentrated on one field the specialist does not know more about that field than the man who is working in many diverse fields, he must admit not only that he is a failure as a specialist, but that he is too stupid to practice medicine at all.

Although specialism, with its implicit claim of superior skill in one direction, is now recognized as both ethical and useful, it remains on a very informal basis. Just as a century ago preparation for a medical career was mainly a personal matter, subject to little efficient legal or professional control, in this country there exists to-day no legal or professional test of the ability of the specialist, accepted as a preliminary to engagement in special practice.

That there must eventually be some check upon the freedom of the medical graduate to engage in special practice, aside from the daily process of "making good" to patients and colleagues, seems indisputable, yet at present it is

extremely difficult to suggest a practical method that shall be accepted as a legal requirement or even informally by the profession itself. The ordinary postgraduate course of a few weeks is inadequate; study abroad is no longer awe-inspiring, since even the laity is becoming aware of the fact that the best men in America are doing work and giving instruction fully equal to that done in Europe; private apprenticeship and membership in special societies are too liable to be criticized as partial to be accepted as legal tests. Special requirements and formal examinations by State boards would require a very cumbrous reorganization, would be subjected to the same criticism, and would, like all similar institutions, fail to demonstrate practical fitness.

In the meantime, although it is apparently impracticable to demand formal tests preliminary to specialization of practice, it is quite proper to ask whether the medical course may not be modified by the introduction of elective studies, not only as a matter of convenience to prospective specialists, but in view of the fact that, irrespective of specialism in the ordinary sense, different personal constructions of the meaning of general practice, different requirements in various localities, and different bents of mind toward internal or mechanical methods of treating disease, really constitute different demands upon the instruction of the medical school.

It must be admitted that the ideal is to train all students of medicine up to the same high standard of general knowledge and skill. A very earnest and reasonable plea could be made by the teachers of each department that the maximum required of the student in that department is little enough for any practitioner of medicine, wherever he intends to locate, whatever his special inclinations, and whether or not he is contemplating general or special practice.

Going back fifteen or twenty years, to the time when no preliminary education was required of the medical student, beyond the expectation—which was occasionally not fulfilled —that he could read, write, and figure; when the course consisted of a single set of lectures in a few of the chief branches of medicine, repeated two or three times in successive brief fall and winter sessions; when college examinations were very lenient and State examinations entirely absent, the idea that every student should take the whole course in every subject was not only correct in theory, but practically necessary.

At the present day, when a full high-school course is regarded as the minimum decent preliminary to medical matriculation, and is actually required in most States, and when a few of the stronger medical schools are requiring part or all of the college course as a basis for the medical training; when the sessions have been increased to four, with carefully graded instruction, and the vacations reduced to the length in vogue in scholastic institutions; when the faculties have been increased from seven to approximately a hundred, even for comparatively small schools, and when the lecture schedule has sunk into insignificance compared with recitations and laboratory and clinical engagements, so that there is scarcely time left for personal study outside of college hours; when most ambitious students expect to supplement the medical undergraduate course by an interneship; when teachers are really teachers and not practitioners with a professorship as a side-line, and are clamoring for the opportunity to give more detailed and more thorough instruction—under these conditions we can more readily accept for consideration the question whether elective courses in medicine are not desirable and may not soon be practically necessary.

We have already reached the point at which

we recognize informally that there are two factors to be considered in estimating the qualifications of a student: what he knows, and his ability to acquire knowledge. Certain state boards have, in a very narrow and short-sighted way, opposed the admission to advanced standing in medical schools of students of superior general education, except as the latter has duplicated the technical instruction of the medical school. The time is near when it must be formally recognized that such training lays general foundations upon which technical superstructures may rapidly be built, and that a mind trained in one line of thought is a better and more efficient instrument when applied to almost any other subject.

In every educational consideration we soon reach a point at which very practical attention must be paid to the old maxim, "Art is long, life is short." Whatever the profession, not only economic but professional necessities demand that the student shall become a producer and practitioner, and shall cease to be merely a consumer of knowledge, before his mind and body have become inelastic and as soon as he shall have reached a stage of reasonable maturity. Indeed, we must recognize that he never can reach a satisfactory state of maturity while he is a schoolboy, whatever we call the school and whatever age the boy is. We must also clearly recognize that the aim to turn out a finished product in human intellect is the worst kind of fallacy. Granted that we could fulfil the dream of graduating as physicians men thoroughly competent in every detail, the very achievement of this ambition would necessarily check their ambition and curtail their ability to advance further.

At just what age the physician should be graduated the writer will not discuss. The late Dr. Wm. Pepper, who was not only a great physician but a wise man, considered that an educational system which precluded the possibility of entering upon active work by the age of about 23 was a mistake. At any rate, we have a very narrow margin for further advancement of either matriculation or graduation requirements in medicine, before we reach a point at which all must admit that we are prolonging too far the period of preparation and curtailing the period of life activity.

Pharmacy and dentistry are essentially medical specialties, in which the course has been so far subjected to selection with a view to practical requirements that they are organized as independent professions, with schools of their own. Of all branches of medicine remaining, ophthalmology is the only one in which it seems at all feasible to eliminate any considerable part of the usual medical course, and in which a considerable experience in general practice is not indispensable. It must be admitted that there is much to be said against making this further exception, and that an ophthalmologist who engages immediately in special practice—and, *a fortiori,* one prepared by a special selective medical course, if such a one were legally authorized—must be much more dependent upon the medical profession proper for the joint care of patients, and must practice his specialty in a more localized way, than one who has had ample experience as a general practitioner. Still, from the standpoint of practical efficiency and economy of effort much may be said, and considerable has been said by ophthalmologists themselves, who are best capable of deciding the problem, in favor of special, elective training for this specialty. A most excellent presentation of this view was made by Dr. Edward Jackson, of Denver, to the American Academy of Medicine in 1903 (see Bulletin of the Academy for that year).

In the medical curriculum of the future a very sharp distinction must be made between general principles and arbitrary details which

are useful only when applied in practice. For instance, the ophthalmologist should understand the histologic elements, the chemic processes, and the morbid changes of the bodily tissues, just as thoroughly as the general practitioner. It is not necessary for him to know the minute anatomy of the brain, the elaborate chemistry of the liver, or the special liability of the stomach to the general pathologic conditions. Conversely, it is easy to see that the neurologist must enter into minutiæ of the brain and cord much more thoroughly than certain specialists or even general practitioners.

Still, it must be emphasized that the main object of an elective system in medical colleges is rather to enable ambitious students to extend their knowledge than to avoid effort by the majority. With the exception of ophthalmology, and not even excepting dermatology and surgical branches of practice, it is difficult to see how the standard medical course can be materially abridged without detriment. However, a concerted action should be taken to weed out from every subject details that tax the memory without having a practical application or throwing light on general principles. Half truths are always confusing, and often a thorough study of a topic or of related topics lessens the mental labor of the student. Thus the reaction of all the fluids of the body can be learned at once, and the action of drugs on the ciliary and iris can be included with that on unstriped muscle generally, much easier than any one detail can be memorized arbitrarily. It has long been a tacit agreement of anatomists that they would not require an intimate familiarity with the deep muscles of the back or the details of the petrous portion of the temporal bone. For most purposes it would be wise to study the skull as a whole and not trouble the student to memorize the details of the separate bones. A vast amount of drudgery can be saved in the study of materia medica merely by omitting the requirement of a full list of galenicals for each drug, not to mention that the materia medica would be enhanced in value, like the sibylline books, by burning about two-thirds of it. Even in physiology, which is the most interesting and most scientific of the medical studies, a great mass of useless detail is taught by some teachers.

Thus in every department the aim should be to teach principles thoroughly, to teach facts of an arbitrary nature, with a view to their practical utility, and to bear in mind constantly that every burden of arbitrary, useless detail that can be removed leaves the student with just so much more mental strength and enthusiasm for the really valuable medical lore.

It has sometimes seemed to the writer that every medical college ought to have two faculties—one consisting of teachers whose sole profession is to instruct students, one of practicing physicians and surgeons whose duties should be to arrange the matter taught in proper perspective, and to act as a check on the didactic teachers.

So much may be said as to the simplification of the general course. The vital part of the subject is the extension of instruction along elective lines. In so far as practical medical branches are taught, whether classified as general medicine and surgery, obstetrics, gynecology, or out-and-out specialties in the narrow sense, it does not seem feasible to abridge the instruction to any marked degree, although in isolated instances certain hobbies, whimsicalities, and ideas that are not substantiated may be eliminated. It is also confusing for a student to find that the same disease or topic, discussed by several teachers—as tumors, by pathologists and surgeons; apoplexy, by the neurologist, practice teacher, and clinical teacher—is differently described. When genuine differences of opinion exist, these should be

placed before the student impartially, and when the apparent discrepancy is merely one of arrangement of the subject, there should be some agreement reached before preparing the lectures.

While it may not prove feasible to provide exhaustive special instruction to suit all individual tastes, there should be an election between a very brief consideration of certain topics destined not to be of future practical interest for residents of a given climate or limitations of skill, and a quite thorough course providing for practice in the tropics, looking forward to sanitary duties, practice in insane asylums, etc., or enabling the student to test his aptitude for operative technique. Each specialist on the faculty might well be required to give two courses, one of a superficial nature intended for future general practitioners, the other going rather fully into details, with the regulation that each student should take not more than one of the latter courses, and should be disqualified for them unless his general, required studies should be pursued satisfactorily. Student-assistantships could also be arranged, not arbitrarily, nor by special favor, but in lieu of elective studies along such lines as pathology, physiology, anatomy, chemistry, etc.

One of the most satisfactory courses that the writer had was given by a man often, and in a sense rightly, criticized as superficial. This teacher taught comparatively few things; he taught almost nothing that was not susceptible of demonstration, and he ignored doubtful points. But what he did teach he taught clearly and thoroughly, and for the most part by actual demonstration. He did not claim to be an authority himself—he cited few authorities; but if he said a thing was so, he proved it, and whenever a theoretic principle had a practical application he ruthlessly invaded the territory of the corresponding teacher of the "practical branches." The result was that what he taught stuck, whereas the teaching of men of much greater erudition was forgotten.

Aside from the more extensive courses corresponding to the ordinary branches taught in practically all medical schools, the following strictly elective subjects may be mentioned, as having greater or less usefulness for various students, and as feasible, at least for the more elaborately organized universities: Sanitary duties, life insurance, medical library work, medical stenography, medical editorship, medicolegal practice (mentioned here as the usual courses are so incomplete, especially from the legal side, as to give little more than an inkling of the subject), medical statistics, including census compilation, etc.; medical history.

It is not intended to be implied that the function of the medical college is at present adequate preparation for specialization, though ultimately it is highly probable that this function will be recognized, and, indeed, that specialization will not be allowed without training in a university. Still, with the increase of matriculation requirements and the inevitable restriction of medical study to those seriously minded to pursue professional duties in a broad spirit, the individuality of the student is bound to assert itself, just as it has already in the literary college. Even at the present time, without regard to formal specialism, provision may wisely be made, for example, for the student with a leaning toward operative work, toward the use of mechanical or electrical appliances, toward sanitary science, or who wishes to select one or other specialty as a matter of particular interest in connection with general practice. By a careful economy of time and effort in the standard required course it seems probable that from a quarter to a third of the student's work might advantageously be made elective, under the approval of a faculty committee.

EARLY CIRRHOSIS OF THE LIVER AND ITS TREATMENT.

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Cirrhosis of the liver is a disease of wide and varied interest to both the clinician and the pathologist from its frequency and from the symptoms which it may produce. Out of 500 autopsies at the Johns Hopkins Hospital, advanced cirrhosis was the direct or accessory cause of death in 49 cases, or practically ten per cent. In Berlin, Forster found cirrhosis of the liver in 31 cases out of 3200 autopsies, or about one per cent; and at Kiel, Lange found interstitial hepatitis in 56 out of 3100 autopsies, or about two per cent. These statistics do not cover the mild or beginning cases, which are very numerous; few autopsies fail to show a certain amount of hepatitis, proving that the disease is associated with many and varied conditions; these because of the importance of the liver must be reckoned with in general treatment.

Atrophic cirrhosis of the liver is associated with chronic interstitial nephritis, with cardiac insufficiency with and without renal complications, also arterial sclerosis without either cardiac or renal complications, which points to the hepatic loss of function, with consequent failure to destroy toxins and to imperfect metabolism, being a factor in their production. Mayer, Wickham, Charcot and Gomboult, and others have shown that obliteration of the bile ducts will produce cirrhosis, the failure of the excretion of the bile producing a hepatic toxemia. Alcohol has been accused of producing hepatic cirrhosis, but it is probable, as shown by Boix, that it is not the alcohol, but the organic toxins produced in the perverted digestive processes. Boix's results have been confirmed by the experiments of Welch and Friedenwald. Boix obtained true cirrhosis from the administration of butyric, lactic, and acetic acids. The administration of these organic acids, together with alcohol, caused a cirrhosis, but not so marked as when no alcohol was given, which seems to show that alcohol in small quantities retards the cirrhotic formation. Extract of feces, the bacillus coli and its toxins produced no cirrhosis. The cause of cirrhosis, as far as experimental evidence goes, is the absorption of toxins from the intestinal tract formed in perverted digestion and the reduction in the outflow of bile, preventing the elimination of the toxins from the liver. Syphilis and malaria are also causes which, though not due to intestinal intoxications, are toxemias; they produce excessive hemoglobin destruction, increasing the amount of bilirubin formed, which, if not eliminated by the bile, remains in the circulation, producing the icteroid discoloration of the skin and acting as a toxin.

The early manifestations of hepatic cirrhosis prior to the formation of structural changes which can be recognized by physical examination are very indefinite; in fact, they may be produced by congestion. It must be remembered that cirrhosis of the liver occurs in the young, and may be congenital, in middle life and in old age, in the abstemious, in the glutton, in the alcoholic and in the teetotaler, and that its manifestations are often paroxysmal in character; that it may be associated with general decline of health, icteroid discoloration of the skin, feeling of weight or vague dis-

comfort in the hypochondrium, loss of or capricious appetite, irregularity of the bowels, the evacuations showing perhaps occasionally a deficiency of bile, a broad, flabby, coated tongue, a foul breath, loss of weight, a muddy, leaden complexion, with a permanent dilatation of the cutaneous capillaries, a true telangiectasia in various parts of the body, especially in the face. This telangiectasia is of great diagnostic value. Such a group of symptoms as the above, when combined with irritability of temper, mental depression, insomnia, mental slowness, with various nervous symptoms, the result of the toxemia, are strong evidences of commencing cirrhosis and hepatic insufficiency, while a history of alcoholism, excessive appetite, long standing indigestion and constipation prove that whatever other organs may be implicated the liver functions are deranged. Certain physical signs are also often present in the very early stages, such as distention of the abdominal veins, hemorrhoids, and tympanites of the abdomen. The above symptoms are what could theoretically be expected from hepatic insufficiency, and though cirrhosis may not be the cause of the liver incompetence, it is probable that it will be a result if the incompetency becomes chronic. The urine often gives considerable confirmatory evidence, the presence of bile pigments in the urine in small amounts is suggestive; the excess of ammonia nitrogen, the result of acidosis, as well as excess of uric acid and residual nitrogen, are pointers; but the diagnosis of hepatic disease in the clinical laboratory is not satisfactory; analysis of the bile, if it were possible, would give valuable information.

The functions of the liver, in spite of an enormous amount of work, are as yet imperfectly understood. They can be briefly summarized as having to do with the metabolism and storing of the various food substances. It also probably both forms and destroys uric acid. It is the seat of the most energetic oxidative processes of the body, which are of many kinds and due to many varieties of oxidative ferments, producing tyrosin, leucin, hexon bases, and other advanced products of proteid digestion. While the above processes occur in various other organs to a less extent and less actively, the liver has the unique function of forming and excreting bile, a function which is closely connected with its physiologic action, and also with the intestinal digestion and absorption of fats.

Bile, when injected into the circulation, is toxic, 4 to 6 Cc. per kilo of animal causing death in convulsions. The coloring matters are responsible for two-thirds of the toxicity, as bile filtered through animal charcoal loses this amount of toxicity. The bile salts have a powerful cytolytic action, but they are never found in normal blood. (Croftan claims to have found them in normal blood, but in very minute quantities.) With the bile are eliminated many of the mineral poisons which have been arrested by the liver, as well as some other products of proteid decomposition.

The free flow of bile into the intestine has an important influence on the functional power of the liver, as well as on the digestion of fats and the peristalsis of the intestines. Although the bile is not germicidal, putrefying easily outside the body, in the intestine it seems to inhibit the growth of bacteria, as has been shown by an increased elimination of indol and ethereal sulphates in the urine, when the quantity of bile is decreased, and by their decrease on the administration of sodium glycocholate mass.

The active principles of the bile are the bile salts, tauro- and glycocholate of sodium. They hold the cholesterin and bilirubin in solution

and prevent the formation of gall-stones, and also when given by the mouth will dissolve stones *in situ*. Being resorbed from the intestine they are cumulative when administered, and may, if given over a long period, cause loose movements of the bowels, with tenesmus. As has been mentioned, bilirubin is toxic, and it is of importance that its elimination should be accelerated, which can only be accomplished by increasing the flow of bile. As yet no cholagogue has been found except bile salts; the drugs mentioned as having this action in the Pharmacopœia have time and again been shown to have no such action.

Poisons circulating in the blood cause a change in normal bile, increasing its viscosity, agglutinating the walls of the bile ducts, obstructing their lumen, and causing retention of bile and stagnation of the portal circulation. Under such conditions the pigments are forced into the circulation, giving the icteroid discoloration of the skin which is seen in plumbism, malaria, typhoid fever, syphilis, phosphorus poisoning, and many other diseases, the result of a toxemia.

Gall-stones appear to be the result of inflammation of the gall-bladder, which causes a reduction in the quantity of bile acids secreted. Austin found in three cases of biliary fistula, after operation for stone, that the bile contained only a small proportion of cholalic acid compared with cholesterin; under normal conditions human bile, according to Hammerstein, contains twelve to thirteen times as much cholalic acid as cholesterin. Austin found in his cases that the amount of cholalic acid was only one-eighth of the cholesterin. Evidently the absence of bile acids is connected with the formation of gall-stones.

Vaughan Harley and Wakelin Barratt inserted cholesterin gall-stones into the gall-bladders of healthy dogs without producing inflammation, and found that in from six to twelve months they were completely dissolved, but when cholecystitis was induced at the time of the introduction of the stones, no solution took place, proving that the absence of the bile salts caused by the inflammation prevented the solution of stones, and it would seem to follow that the administration of the bile salts will not only prevent the formation, but dissolve stones already present.

Hepatic cirrhosis is the result of a toxemia, and its treatment must therefore consist in the removal of the cause of the intoxication, with, at the same time, stimulation of the liver so that it may do its part in the oxidation and elimination of the poisonous substances. Attention to gastrointestinal digestion is of the first importance; if the food supply of the organism is perverted or reduced, it cannot be expected to recuperate. The elimination of bile from the liver should be increased by the administration of sodium glycocholate mass with the addition of small doses of mercury. The fluidity of the bile can be increased by the administration of alkaline mineral waters with sodium salicylate, which latter drug seems to have some influence in increasing the fluidity of the bile. Biniodide of mercury with iodide of potassium has a beneficial effect in many cases of nephritis which are associated with hepatic insufficiency. Black, of Edinburgh, called attention to this treatment some years ago.

As toxemia enters so largely into the etiology of nearly all diseases, and as the liver is the organ upon which devolves the duty of extracting, oxidizing, and eliminating the toxins, it is evident that in all diseases hepatic efficiency should be promoted, an important factor of which is a free elimination of bile.

THE ROLE OF THE MEDICAL PROFESSION IN COMBATING THE SOCIAL EVIL.[1]

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The movement inaugurated recently in Philadelphia to improve public morals by seeking to control and, so far as may be, stamp out the social evil should enlist the sympathy and co-operation of all right-thinking citizens. A marked tendency to spread of many forms of vice, including the social danger, has been observed in a number of our largest cities in recent years.

Fortunately, the flagrant offenses agamst public morality and decency have caused an awakening and in certain quarters a systematic investigation into this notorious business, which it is earnestly hoped will lead to the adoption of effective measures of control or even complete suppression. Society can no longer set forth the excuse for non-interference, or masterly inactivity, that the individual must be expected to efficiently protect himself against this form of vice.

In the bitter controversy that has been waged over the question whether the responsibility for violation of the moral law with its dire consequences rests with the individual or society at large, two facts stand out prominently. First, the individual is entitled to a knowledge of the awful and far-reaching pathological consequences of venereal disease, including syphilis, just as much as in the case of any of the well-known contagious and infectious diseases. Secondly, if men are to be held accountable for their acts, they must be enlightened at an early age, since both venereal disease and syphilis are contracted in a large percentage of the cases before the twentieth year. Assuming the correctness of the principle of personal responsibility for voluntary acts, as applied to men of matured intelligence, it would be manifestly unfair if not positively inhuman to hold boys equally accountable for their immoral deeds.

The moral aspect of the question of the social evil is also to be borne in remembrance. It has been well said that "there are greater evils than physical disease connected with vice."[1] Time and space, however, will not permit my entering upon a full discussion of this important phase of the subject, but brief reference to it will be made hereafter.

From the foregoing facts it is clear that prophylactic measures are indicated first of all, and among these I am inclined to give first place to a well-directed campaign of education, although without doubt, to the same end, municipal, sanitary, and governmental supervision of the social evil are influential accesssories. In the work of popularizing information regarding the evil under consideration the physician must bear a conspicuous part. He comes into contact with its physical ravages and sees with equal clearness the influence of an unfavorable environment in degrading public morals. Undoubtedly, men are too often swayed by animal passion, but when they are trained to appreciate the well-known effects—physical, mental, moral—of yielding to immoral impulses, they naturally protect themselves by restraining their passions for fear of these dreaded results.

The physician is by virtue of his training

[1]Read before the Philadelphia Society for the Study and Prevention of Social Disease, May 3, 1906.

[1]"The Social Evil," by The Committee of Fifteen, page 69.

made acquainted with the causes of the ever-increasing sexual immorality, hence should be thoroughly alive to the necessity of an improved system of moral education. As a matter of fact, however, the medical profession has not been aroused to a realizing sense of its plain duty in respect to this vitally important question; it has scarcely lived up to its ideals in this respect, so that the campaign of education must be extended primarily to the medical profession itself.

Physicians connected with our larger hospitals and the out-patient departments of these institutions cannot fail of being impressed with the rôle that syphilis and venereal diseases play in all departments of medicine as etiologic factors. In the nervous divisons of our charitable institutions not less than one-third of all cases treated are caused by this class of diseases, especially syphilis.

Some interesting facts bearing upon this inquiry were stated in a public lecture by Geheimrath Dr. Schafer, at the great Charité Hospital in Berlin. He showed that, after excluding the proper venereal divisions, "from 5 to 25 per cent of the patients in the different sections of the Charité Hospital for internal medical complaints were suffering from disorders in connection with venereal diseases. In the section for eye diseases 20 per cent and in the section for lunatics 13 per cent of the cases were due to the above named diseases and their complications. In the chirurgical sections were found between 3 and 20 per cent, and in the sections for female diseases over 30 per cent, the majority owing to complications arising from gonorrhea."[1] Such facts as these cannot fail of convincing the most skeptical person of the social significance of the diseases under consideration.

Before medical men can expose to the gaze of others not only the diseases resulting from the social evil but also its true extent and significance to society, viewed from the standpoint of vice, they must inform themselves upon one of the most obscure problems in social hygiene; they must grasp a few simple, plain facts, particularly with reference to the causes of the vice in question. Numerous hypotheses have been advanced as to the underlying causative influences operating to produce and maintain prostitution; but without stopping to discuss these owing to lack of time and space, it is my fixed belief that considered from the standpoint of sex the male is the principal transgressor in bringing about gross immoralities.

Nothing is of superior importance for the physicians to recollect in this connection, to the question of infections in marriage. Fournier's statistics show that 20 per cent of females having syphilis are infected by their husbands soon after marriage. Dr. Grandin, of New York City (quoted by Morrow), states that gonococcic infection is responsible for 60 per cent of all gynecologic operations performed by surgeons. Such eloquent statements as these might well be calculated to excite a wave of righteous public indignation toward a profession which should have long since concerned itself with the question of the diffusion of practical knowledge of the subject among the laity. I cannot but feel that our colleges of medicine are scarcely alive to the moral responsibility involved in the social danger. The teachings of these schools should be of such a character as to insure a sympathetic interest on the part of all graduates in the solution of this vexed social problem.

Physicians must be made to feel a moral responsibility in connection with the question of the rigid enforcement of recognized prophylactic measures. It cannot in justice be argued that the medical profession is indifferent to the

[1] Quoted by Prof. Erik Pontoppidan, "What Venereal Diseases Mean, and How to Prevent Them," p. 34.

social evil from selfish motives or owing to the fact that successful prevention of venereal and syphilitic affections would to a like extent decrease professional labors and pecuniary returns. My position in this matter is supported by the fact that in the crusade against tuberculosis the irresistible forces at work are composed principally of physicians; and about two-thirds of the membership of the National Society for the Study and Prevention of Tuberculosis is likewise made up of members of the medical profession. Much credit belongs to the medical profession, which is ever exemplifying the maxim of John Locke: "Prevention is better than cure and far cheaper." As in the case of tuberculosis so in relation to the proposed work of the "Philadelphia Society for the Study and Prevention of Social Diseases," it will be found that once thoroughly aroused by the stimulus of an organized effort, medical men will be among the foremost in the movement to limit the evil, which all hope to see remedied.

During the past decade a number of physicians of this country, notably Drs. Prince A. Morrow and Edward L. Keyes, of New York, and Dr. Robert N. Willson, of Philadelphia, have manifested a lively and laudable interest in the question of limiting the social danger, and their efforts have led to the formation of societies having for their object the prevention of a class of diseases which has worked incalculable physical harm and even racial deterioration. The present writer feels convinced that these societies will prove of special value in remedying the lack of interest which has hitherto existed both in the medical profession and the laity. It has ever been true of the medical profession that the major portion of important and far-reaching work along social and hygienic lines has been accomplished under the stimulus of an organized society, and it is my settled belief that the "Philadelphia Society for the Study and Prevention of Social Diseases" promises to become a living force making for better things in hygienic and moral education.

Having pointed out the necessity for giving needed enlightenment to the youth of our land as a means of limiting the spread of the "great black plague," and having also indicated the desirability of further training of the mass of the medical profession in certain aspects of the social danger, I now pass to the question of the diffusion of practical information on the subjects mentioned among the laity, particularly the young men (and this paper deals with the question of the social evil principally from the standpoint of men), by the medical profession.

Medical men should supplement the teaching of our public schools, colleges, and universities regarding the subject of the social evil, and they are in a better position to deal with this vexed and delicate question than those engaged in other callings. As pointed out by Morrow,[1] "Physicians are habituated to these horrors and accept them as the deplorable but inevitable experiences incident to their professional work. The public never hears of them."

Physicians have the advantage of personal contact with young men, and they have abundant opportunity to afford the necessary personal instruction and advice. Of course, the question of the best method of procedure is one that requires earnest thought and extended consideration. In the case of young individuals it might be best to accomplish the object through the medium of the parents. As before stated, if young men were to receive the requisite information regarding the moral aspect of the social evil, its extermination would be in great part effected. Meanwhile parents should be properly and fully informed of the

[1]The Society of Sanitary and Moral Prophylaxis; Its Objects and Aims, p. 12.

importance of the venereal diseases as compared with other infections in men, and the almost inconceivable extent of their ravages in the form of pathologic conditions in women.

In this way the active coöperation and sympathetic interest of the parents could be readily enlisted. It is not believed that this plan would entirely remedy the evil under consideration, since the immoral passions are in some cases at least beyond the control of the individual. This leads me to observe that it is vitally important that fathers enjoy the absolute confidence of their sons in relation to matters sexual, so that accidental infection with the specific organism of either of the two great venereal diseases—gonorrhea and syphilis—be not neglected from the standpoint of treatment. It seems almost superfluous to urge the necessity for early vigorous treatment with a view to obviating the deep and all-pervading changes that are often witnessed and wholly dependent on the undue modesty of the sufferer.

The present article does not embrace an analytical consideration or study of prostitution; a few well-established truths, however, bearing upon the evil may be briefly stated. In the first place, any proposed remedial measure that is not directed toward the eradication of the cause or causes of the vice will meet with emphatic refutation when practically applied. For example, compulsory legislation intended to eradicate this great scourge of humanity has until date of writing proved a signal failure.

I believe that erring women should be led if possible to the paths of virtue from which they have as a rule been craftily guiled away, but more important still are preventive measures that will tend to avert the commission of immoral acts. Those measures are most effective that are dictated by considerations of public health and public morals, the former in particular. This fact being admitted, it follows that the work of pointing out the ailments resulting from illicit intercourse and the precautions which should be taken to prevent such accidents, as claimed in the foregoing observations, devolves upon properly educated physicians. Physicians can also fully and easily appreciate the loss to the community from the infirmities—bodily and mental—caused by gonorrhea and syphilis. Without doubt it comes within the province of physicians to teach and enlighten the public as regards the precise meaning and intent of these desolating diseases.

The most effective work, however, is to be accomplished through organized effort, in which the medical profession must bear the "heat and burden of the day" in the matter of investigating existing conditions and indicating the means that promise to minimize and finally to eradicate if possible this well-known evil. The profession should adopt a general plan of action if it would hope to execute a winning crusade against the social evil, and I would respectfully suggest the individual parts or segments that should enter into the skeletal outline of such a plan, omitting the details of their articulation for want of space:

(1) A campaign of education which is to be extended primarily to the mass of the medical profession; this should embrace (*a*) agitation through coöperative effort on the part of high-class journals, medical writers, and medical organizations, with a view to giving enlightenment to that profession, and (*b*) the proper training of medical students not only in the wide-spread significance of the physical ailments resulting from immoral indulgences, but also the moral responsibility involved in this gravely menacing evil.

(2) The education by the medical profes-

sion of the people, more particularly the rising generation, either directly or with the aid of the parents.

(3) The medical profession should invite the coöperation of sanitarians, statisticians, philanthropists, and public-spirited citizens in general.

(4) In order to effectively carry out this work a perfect and complete organization of professional and lay forces animated by a unity of purpose and action is absolutely essential.

(5) Governmental supervision, which should partake of a sort of parental care or oversight, and special municipal regulations, are to be recognized as auxiliary agencies of considerable value in suppressing the social evil.

THE DIAGNOSIS OF CARCINOMA OF THE STOMACH.[1]

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On account of the work that has been done of late years on the stomach—on its physiology by Pawlow and his school, and on its surgery by Moynihan, Mayo-Robson, Mayo, and others—attention has been directed toward diseases of that organ, and particularly in this country toward their surgical relief. Carcinoma of the stomach has especially been in the limelight, and the surgeons have made some very sweeping statements and have chided both the general practitioner and the internists for their conservatism and dilatory methods. The problem now it would seem simmers down to a question of diagnosis, and it is with this problem that we are to concern ourselves to-day, not so much to see if we can arrive at any solution, but as it were to orient ourselves and to lay down temporary rules, if possible, for our guidance. It is with this purpose that the following is presented to you:

Certain etiological and pathological factors are of moment in the diagnosis of cancer of the stomach. Although we know nothing of the active cause of cancer anywhere, certain predisposing causes are well understood. Thus the male sex and the middle or later decades are predisposing factors, though so many exceptions to both are found that their value in diagnosis is relatively slight. Certain local gastric conditions, as chronic gastritis, and especially gastric ulcer, are recognized as factors, while occasionally benign tumors, as adenomatous polyps, have preceded cancer. Chronic irritation appears to be a factor, and this perhaps explains the frequent occurrence of cancer on the lesser curvature near the pylorus, for this is the point of greatest trauma. It is only of pathological interest that the main types described are the cylinder-celled carcinoma, the medullary, scirrhus, and colloid carcinomata, as Kaufmann classifies them. From the clinical standpoint, however, the frequent occurrence of pyloric stenosis with its resulting hypertrophy and dilatation of the stomach is important. The wall of the stomach is frequently infiltrated, and distortions occur such as the hour-glass contraction. Ulceration is frequent in consequence of fatty degeneration and necrosis, followed by digestion by the gastric juice. Hemorrhage is frequent, usually a parenchymatous oozing, though profuse bleeding may occur. Putrefaction sometimes de-

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velops with a resulting stinking discharge. The ulcers may perforate the lesser or greater peritoneum, or if adhesions to neighboring organs by local tumor invasion are present, abscesses of the adherent organs may result. Gastroptosis is often an associated condition, while the involved portion of the stomach usually shows varying degrees and forms of gastritis. The occurrence of cancer on the basis of an old ulcer has been noted above. Metastases in the lymph glands are most frequent, especially those of the lesser curvature. These metastases may be out of proportion to the size of the original tumor. Extension by the lymphatics and by the thoracic ducts to the lungs is not uncommon. The peritoneum is often involved by extension through the lymphatics. It may be involved *in toto* or only in part when the mesentery is oftenest affected. The liver frequently shows secondary involvement, by direct extension less than through the lymphatics, and rarest of all by tumor masses growing into the portal vein and so carried to the liver. The spleen may be involved in the same way through the splenic vein, but more frequently the invasion is by direct extension or through the lymphatics. The pancreas may also be involved. Physiologically there develops an atrophy of the mucosa, as shown by absence of hydrochloric acid and the ferments, and often more or less motor insufficiency even when no pyloric obstruction is present.

The diagnosis will rest chiefly on certain symptoms and physical signs. The history is apt to show an insidious onset with vague gastric symptoms, which are often due more to the associated gastritis than to the cancer itself. There is usually anorexia, and an aversion toward meat is frequently noted. A feeling of distress in the stomach is often present. Belching occurs and the gas may taste badly. Constipation is the rule. Pain is usually present and often predominates over all the other symptoms. It is usually located in the epigastrium and may radiate to the back or to the shoulders. It is rarely sharp, but as a rule is a dull, heavy pain. It is usually aggravated by eating. Fenger showed that it is due to the inclusion of nerve filaments in the tumor growth. Vomiting is frequently complained of, often the form due to dilatation, when large amounts of undigested food are voided at intervals of two or three days. When there is no stenosis, however, vomiting is frequently absent. Often a history will be obtained of the vomiting of blood or of black, partly digested blood. Rarely will a profuse hematemesis be recorded; oftener blood in the stools will be noted. As a rule there is a history of progressive loss of weight and strength, and frequently the patient complains of lassitude, lack of initiative, etc.

The examination will reveal in advanced cases a color which is partly due to anemia but is of a peculiar ashy character. With the wasting the condition is known as cachexia. The skin and muscles are flabby and toneless, and edema is often present. The latter must be looked for especially in the retromalleolar fossæ and over the sacrum. The pulse is usually rapid and of low tension. The temperature is often slightly elevated even when there is no secondary infection. At times there is a small carcinomatous gland to be found in the left supraclavicular fossa. When present this will assist materially in the diagnosis. The tongue is usually furred. In the chest examination nothing of value is to be elicited as a rule. There may be hemic murmurs and at times dilatation of the heart. Inspection of the abdomen may show a tumor, and when pyloric obstruction is present peristalsis may be visible. Palpation frequently shows tenderness in the epigastrium even when no tumor can be made out. When a tumor is present, its size and location vary. It usually

moves with respiration. The entire stomach may be palpable and tender. The dilated stomach may often be felt, and splashing may be elicited. This is of value only when the stomach should be empty. It indicates motor insufficiency under those conditions. Percussion and auscultation are of relatively little value, though the former may show dilatation.

A measure that will often be of value is the dilatation of the stomach by a mixture of tartaric acid and soda bicarbonate (ää 3j), or through a tube with a bellows. By this means a tumor of the anterior wall and greater curvature may become more prominent, while one on the lesser curvature or posterior wall is covered over. This will aid in determining the outline of the stomach also. If the greater curvature goes below the umbilicus it indicates dilatation. If the lesser curvature is visible it indicates gastroptosis.

Inflation of the colon with air may aid in distinguishing tumors of the colon.

The examination of the stomach contents gives as a rule valuable data for diagnosis. After either the Ewald test breakfast, consisting of a slice or two of bread and a glass or two of water, or the Riegel test meal, consisting of soup, meat, bread and potatoes, the findings are characteristic. The amount removed varies with the presence or absence of dilatation. The material is undigested and there may be a sour odor. Often small flecks of blood are seen, or there may be black grumous masses made up of partly digested blood—the so-called "coffee grounds" material. There is usually an excess of mucus. Chemical examination shows no free hydrochloric acid and the total acidity is low. Lactic acid is usually present, as well as butyric and other organic acids. Blood may be recognized by chemical tests. Microscopically one notes that digestive processes are slow, meat fiber when present often showing the striations. There are yeast cells in abundance and many long bacilli. These may be leptothrix from the mouth or the so-called Oppler-Boas bacillus. They may be differentiated by adding a drop or two of Lugol's solution, when the former takes on a bluish tinge. Both are Gram-positive, but the Oppler-Boas bacillus often stains unevenly, and one end may be positive and the other negative. The long forms are particularly important. Sarcinæ are usually absent, but may be present where a cancer has developed on the basis of an old ulcer. Physiologically examination shows absence or a marked decrease of the pepsin and rennin. As a general rule it may be said that the ferments vary directly with the hydrochloric acid, and the determination of the latter suffices clinically.

The examination of the stools may often be of value. As a rule there are more undigested fragments than is normal, and muscle fibers may show striations. Very valuable evidence is often gained by the Gram stain. Attention has been directed to this feature by the Neusser clinic in Vienna, and Dr. C. A. Elliot, of Chicago, has recently communicated some observations on the subject. The normal bacteria of the intestine being chiefly of the colon group are Gram-negative. Where the lactic acid bacillus is present in the stomach it finds the conditions present in the intestine that favor its development, and as a result it is often more numerous in the stool than in the stomach. It is Gram-positive and shows the same peculiarities as in the stomach contents, being unevenly stained. It is always thin, but may be long or short. Other Gram-positive organisms may be present and may predominate over the colon group. Cocci are numerous where an ulcerative process is present, while many positive bacilli are present where fermentation is marked. These are usually thick and stain evenly. They are anaerobic. When doubt obtains cultures will be of assistance. A series

of stroke cultures over the surface of plates of 2-per-cent glucose agar will show after twenty-four hours' incubation pin-point size cultures, which under the low power are thin and transparent and show an irregular border with chains of bacilli projecting from the central mass. They are easy to separate from the colon bacillus colonies. In case of doubt the Gram stain will again be of value.

The blood examination is at times important. There is as a rule a secondary anemia present, though there may be an anemia of the pernicious type, with the color index high, poikilocytosis marked, macrocytes and especially megaloblasts present. This pernicious type occurs especially where there is pyloric obstruction. The leucocytes may be normal, but are often somewhat increased. A leucocytosis is frequent where secondary infection is present. There are as a rule no qualitative changes in the leucocytes, but where bone metastases are present myelocytes may be found. Von Leube calls attention to the fact that lymphocytes may be relatively increased in pernicious anemia owing to a decrease of the bone-marrow elements, the result of atrophy of that structure.

Another laboratory method that may be of value is the demonstration of the absence of potassium sulphocyanate in the sputum. Normally the addition of a few drops of dilute ferric chloride to the acidified saliva gives rise to a red color from the formation of ferric sulphocyanate. Where a carcinoma is present this reaction often fails, and almost constantly in cases of cancer of the stomach. It is an expression of the general atrophy of the secretory glands, the result of the neoplasm.

The diagnosis of carcinoma of the stomach can only be made on the whole disease picture, since there is, as cannot be too strongly emphasized, no one pathognomonic symptom. When a patient of forty years or over presents himself with a history of a dull, heavy pain in the epigastrium, with distress after eating, vomiting of a black, tarry material, and with the complaint of anorexia, loss of weight, and lassitude; and when the examination shows a marked pallor with wasting, slight edema of the ankles, a tender tumor mass in the epigastrium and perhaps dilatation of the stomach; and when the stomach contents after a test meal show absence of free hydrochloric acid and the ferments, presence of blood and lactic acid and the Oppler-Boas bacilli—then the diagnosis of carcinoma of the stomach can be made almost as surely as in cases of cancer of the breast or of the uterus. Where, however, a few of these findings are absent, so that the clinical picture is incomplete, or where one set of signs predominates, the differential diagnosis is often hard and at times impossible. Owing to the variety of conditions that it may be necessary to exclude, it will be better to consider certain groups of cases.

The first of these is made up of those cases in which there is evidently a malignant process somewhere, but its location is a question. The diagnosis in these cases may be of great difficulty. Attention must always be directed to the stomach on account of the frequency of cancer there. Where no tumor mass is present and no gastric symptoms have been elicited in the history, the examination of the stomach contents will be of special value. It is to be remembered, however, that a cancer in the neighborhood of the stomach, as in the pancreas or in the colon, may give rise to gastric atrophy with consequent absence of hydrochloric acid and ferments, and at times with presence of lactic acid and Oppler-Boas bacilli. In such a case presence of hydrochloric acid would speak strongly against cancer of the stomach, while its absence could be due to either cause. Where a tumor mass is present it may aid, but even here doubtful cases will occur. A case recently seen at Wesley Hospital illustrates this fact.

There were indubitable signs of malignancy and a tumor mass was present in the epigastrium just above the navel. It was hard, tender, moved with respiration, and was fairly motile with manipulation. It could be held down with the fingers during expiration. We thought we could distinguish peristaltic bulging of the colon above the tumor. The stomach tympany was small and was well above the tumor even after dilatation. The stomach contents showed no free hydrochloric acid, no lactic acid, no Oppler-Boas bacilli, and no blood. On account of the incomplete picture presented by the stomach contents, and the location, shape, etc., of the tumor mass, most of us diagnosed carcinoma of the colon. Operation showed it to be a cancer of the greater curvature of the stomach. Perhaps dilatation of the colon might have saved us some embarrassment in this case. At times secondary tumors, particularly of the liver, are clearly to be made out, but the location of the primary process is doubtful. In these cases the stomach must be excluded as the primary focus. As an example of the difficulty of diagnosis in these cases, a case seen in the Neusser clinic in Vienna is worthy of passing note. There was a diffuse enlargement of the liver with evident signs of malignancy. Absolutely no primary focus could be found, and by a process of exclusion a diagnosis of the very rare primary cancer of the liver was made. Autopsy showed a cancer of the esophagus three inches long and three-fourths of an inch wide, lying a few inches above the cardia. It was absolutely latent clinically. Other primary foci that may be latent are the prostate, thyroid, and suprarenals. A case illustrating the difficulty of diagnosis of secondary tumors was one seen not long ago with Dr. Pickard, of Maywood. There was an enlarged spleen with irregular nodules uniformly distributed over the entire surface. That it was spleen was evident from its location, definite outline, etc., though its shape was peculiar. Marked evidences of malignancy were present, and the rapidly progressive clinical course confirmed this diagnosis. That it was a secondary process is probable from the uniform distribution of the nodules, but where the primary tumor was is a question. One would think here of a tumor near the cardia extending into the splenic vein on account of the uniform distribution of the nodules. An autopsy was not to be obtained, and this must remain an unsolved case.

A second group of cases is that formed by other conditions that may resemble cancer of the stomach more or less. Such a case is one that was recently operated on at Wesley Hospital for cancer of the stomach, in which adhesions between the colon and stomach were found. The autopsy a few days later showed an old tubercular ulceration with adhesions. The ulcer was probably primary in the colon. A case illustrating the difficulty of diagnosis from primary pernicious anemia has been under observation in Dr. Mix's section of the South Side Free Dispensary. I am indebted to Mr. A. D. Kirby, of the present senior class of Northwestern, for the clinical data. The patient is a Swedish woman forty-two years old. Family history and habits negative. In the past history nothing of moment. The present illness dates back three years, beginning with pain in the epigastrium, not directly connected with the taking of food, though it was relieved by vomiting, which occurred as a rule an hour or so *post cibum*. It was accompanied by nausea. There was never any blood vomited, nor could any history of bloody stools be obtained. There were sour eructations, especially from twenty minutes to one-half hour *post cibum*. After thirteen weeks' treatment in a hospital the patient was better, but still had pain in the epigastrium at irregular intervals. The pain was increased by eating.

Vomiting has occurred at intervals of about a week ever since. She has noted some abdominal tenderness from the pressure of her clothes. She has had eructations, but not so sour as formerly. Diarrhea has been fairly constant. The examination showed a marked anemia, and under observation a slight cachexia has developed. There is a lemon-yellow color of the skin and the conjunctivæ are pearly-white. There is slight edema about the ankles. The pulse is rapid and of low tension. There is a slight dilatation of the heart and a soft murmur at the apex that seems to be hemic. The lungs are normal. There is some tenderness and rigidity in the epigastrium, but no distinct tumor. The stools are loose and are Gram-negative. The stomach contents show no free hydrochloric acid, total acidity very low, no blood, no lactic nor other organic acids, and no Oppler-Boas bacilli. The blood findings are those of pernicious anemia; red corpuscles decreased markedly, color index high, poikilocytosis marked, polychromatophilia present, micro- and macrocytes numerous, and a few megaloblasts present. There is no doubt that we have to do now with an anemia of the pernicious type, but whether it is a true primary pernicious anemia or not is a question. The history points strongly to an ulcer of the stomach, even in the absence of a history of hematemesis. The findings now are those of gastric atrophy. The possibility of there being a carcinoma present now must be considered. The development of cachexia speaks strongly in favor of this. That the case is not one of primary cancer of the stomach is probable from the duration of the process. The presence of an almost absolutely Gram-negative stool speaks against cancer of the stomach. Neusser goes so far as to exclude cancer on this finding where the differential diagnosis lies between cancer and primary pernicious anemia. It seems an impossibility to make a positive diagnosis before autopsy.

A third group of cases is made up of those where a cancer is present, but the predominance of a certain group of symptoms leads to confusion. A case seen at the County Hospital a few years ago illustrates this well. A woman of about fifty came under observation showing a marked hemorrhagic diathesis. There were purpura, epistaxis, hematemesis, and melena. The primary blood diseases were thought of, but the diagnosis was cleared up by the examination of the stomach contents, which showed the typical findings of carcinoma. The diagnosis was confirmed by autopsy. Another case at the County Hospital showed the signs of subphrenic abscess, and again only the stomach contents cleared up the diagnosis. Autopsy showed an ulcerated cancer of the stomach with perforation into the lesser peritoneal cavity. A case seen in the Neusser clinic was diagnosed tubercular peritonitis on account of a massive and very tender tumor in the left hypochondriac region. The pain was intense and there was some fever. Ehrlich's diazo-reaction was present in the urine. A few days before death, however, lactic acid bacilli were found in the stools, and the diagnosis of cancer of the stomach was made. Autopsy showed a massive medullary carcinoma of the greater curvature of the stomach.

Perhaps the most important group of cases from the diagnosis standpoint, however, is that where there is surely some disease of the stomach present but its nature is a question. The symptoms may be those of a chronic gastritis, for example, and the question asises as to whether or not carcinoma is present. When the intimate etiological and clinical connection between the two conditions is borne in mind the differential diagnosis is seen to be very important and difficult. It is to be noted that actual pain is not often present in gastritis, there being merely a feeling of discomfort after meals. Free hydrochloric acid is often absent in chronic gastritis, but is practically

always absent in cancer. Lactic acid and the Oppler-Boas bacilli may rarely be present in gastritis, as may also blood. Either may improve considerably under appropriate treatment, but failure to respond speaks for carcinoma. The clinical course will, to be sure, often clear up the diagnosis, but then it is often too late to do anything. A history of long-continued trouble speaks against there being a primary cancer, but does not of course preclude the possibility of there being a secondary tumor. The differential diagnosis is often impossible.

Ulcer of the stomach will often furnish difficulty in diagnosis. This does not mean of course the frank or more acute ulcer occurring in the young, where more or less profuse hemorrhages, pain coming on immediately after eating and relieved by vomiting, and hyperchlorhydria make a diagnosis of ulcer easy. It is in the more chronic or latent ulcers that difficulty arises. Here there is usually a history of indefinite gastric disturbance lasting over a period of years. There may or may not have been hematemesis. Examination shows often a tender spot in the epigastrium, and frequently a small tumor or at least an indefinite resistance may be made out here. Often there is a tender point two inches to the left of the midline at the level of the tenth to twelfth dorsal spines. The stomach contents may show free hydrochloric acid diminished or even absent, and there may be blood. Lactic acid is usually absent. Yeast cells are frequently found. At times the history of hematemesis at intervals for years together with indefinite gastric symptoms makes a diagnosis of latent ulcer probable, and then the possibility of a malignant transformation must be considered. A case seen with Dr. Scott of Melrose Park might be cited to illustrate the difficulty of this diagnosis. The patient was a man of thirty-six years who had had some stomach trouble two years before. He came under observation with a severe gastric hemorrhage. It was so severe that the symptoms of acute anemia were marked. He gave a history of a gradual failure for the last few months, with constant dull pain in the epigastric region. Examination showed tenderness in the epigastric region, but no tumor. Examination of the stomach contents by the usual methods was contraindicated. The stools, however, were found to contain many unevenly staining Gram-positive bacilli resembling the lactic bacilli, and a probable diagnosis of carcinoma on the basis of an old ulcer was made. The patient improved for a day or two under rectal feeding, then had more hemorrhages, and died soon after. Autopsy showed a large ulcer of the lesser curvature with carcinomatous infiltration of much of the stomach wall and of the regional lymphatics. Here the important diagnostic factors were the change in the character of the pain, the wasting during the last few months, and the severe hemorrhages. The demonstration of the lactic acid bacilli in the stools added a valuable factor in the diagnosis. This case too showed well the difference in the result of hemorrhage between ulcer and cancer. Where an ulcer case will withstand a severe loss of blood, the cancer patient shows marked effects from even moderate hemorrhages, and shows also a slow return to the normal after hemorrhages have occurred. A finding that may be of value as showing the development of carcinoma on the basis of an ulcer is a change under observation of a Gram-negative stool into a Gram-positive stool. This offers a method of following a case that is worthy of consideration.

Where dilatation of the stomach is present as the result of pyloric obstruction the important differentiation is between a benign and malignant stenosis. Owing to the diminished absorption of fluids and the poor nutrition

there may develop a marked cachexia even in cases of benign stenosis, and the diagnosis may be of extreme difficulty. Here the degree of completeness of the clinical picture will be of especial value. Particularly the demonstration of traces of free hydrochloric acid speaks against carcinoma, though in a cancer developing on the base of an old ulcer which has produced stenosis by scar contraction there may be for a time free hydrochloric acid present. A rapid diminution under observation will then be a probable sign of malignancy. Sarcinæ are more frequent in benign stenosis, while lactic acid and the Oppler-Boas bacilli are oftener to be found when a cancer is present. The course again will be of value, while a clear, definite history of some process known to give rise to stenosis, as cholelithiasis, ulcer of the stomach, etc., may clear up the case. I wish to emphasize again the importance of the completeness of the clinical picture. It is these cases of cancer that are peculiarly typical as a rule, and variations from the usual picture must be viewed with suspicion.

CONCLUSIONS.

After this brief review of the main diagnostic factors and the differential diagnosis we are in a position to formulate certain conclusions. We can say, first, that it is necessary to study each case that presents itself from every point of view. Second, that the diagnosis can only be made on the entire disease picture. Third, that where the picture is fairly complete the diagnosis is fairly certain. Fourth, that where the picture is incomplete, doubt enters in direct proportion to the incompleteness. Certain factors have a strong negative value. Presence of free hydrochloric acid, for example, is strong evidence against carcinoma, while presence of lactic acid and the Oppler-Boas bacillus is presumptive evidence against anything else. Fifth, the clinical course will usually clear up the diagnosis. But it is just this last state of mind of the practitioner and internist that the surgeons are up in arms against, and it must be admitted that they have a good deal to say on their side. It must be clear that if doubt in the diagnosis exists in some cases up to the autopsy, still more cases must be in doubt at the time that operative interference would be of value. We must then consider the final diagnostic aid that we possess—that is, exploratory laparotomy. The indications for this measure should be strictly but not too strictly limited. I believe we may say that when there is a competent operator at hand, there is comparatively little danger in an early exploratory incision. The indication is a reasonable suspicion that cancer is present, and not, as has been the rule, a reasonable certainty that such is the case. I am convinced that only in this way will the operation be of value. The question of what to do after finding a cancer present, and in fact the recognition of the cancer at operation, belongs to the surgeon and does not lie within the province of this paper. I would not, however, wish to be understood as advising explorations in all cases of gastric trouble, and especially not where advanced cachexia, etc., leave only the location of a cancer in doubt. Even here, however, an operation may uncover an erroneous diagnosis of malignancy and good follow. Each case may be judged on its merits and each finding weighed by itself. It is useless to put down points present in one and absent in another in parallel columns and then strike a balance, as is done in some text-books. One must have an idea of the relative value of factors that is only gained by clinical experience, and one gets clinical experience best by his mistakes. He is not so apt to forget them.

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FURTHER OBSERVATIONS ON CITRATE OF SODA.[1]

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I have used citrate of soda for about two years, during which time I have seen a great many cases of malnutrition. Of these I will now report briefly nine cases.

Case 1.—A baby born at full term with the waxed-paper skin; it had complete anuria for the first twenty-four hours, and urinated but once a day for the next forty-eight hours. The baby weighed 8½ pounds at birth. On account of the milk secretion being delayed, the child was put on citrate of soda, 1 grain to 1 ounce of milk, with 1 ounce of water, at the end of forty-eight hours. In about twenty-four hours after urination became more copious, with disappearance of the dryness and waxed-paper condition of the skin. The child was kept on this diet for some four weeks, during which it was partially breast-fed. At the end of three weeks the baby had a complete desquamation. On the eighth day the baby's weight was 8¼ pounds. At the end of the second week the child had recovered, with a slight gain over the initial weight (weighing 9¼ pounds), and during the third and fourth weeks the net gain was half a pound each week.

Case 2.—Another new-born baby weighed 7½ pounds at birth. On account of deformed nipples in the mother it was necessary that this child should be artificially fed from the beginning. The child was put on citrate of soda, 1 grain to the ounce of milk with an ounce of water. At the end of a week the percentage of milk was increased to 2 of milk and 1 of the water, keeping the ratio the same as to the citrate of soda, 1 grain to the ounce. This baby is now thirteen weeks old and weighs 13¼ pounds. Urination in this baby is very free, quite above normal.

Case 3.—Baby girl, eight months of age, first came under my observation on December 10 last. At that time she weighed 10 pounds. She had been fed on modified milk, Mellin's food, and Horlick's malted milk. She was small, but not emaciated, as she was a small baby. She was put on citrate of soda grs. iij, milk ℥iij, water ℥iij; this amount increased gradually to milk ℥v, water ℥iij, sodium citrate grs. iij. The baby gained half a pound a week for the first two weeks. At the end of the third week there was a gain of nearly a pound. The child had a well-marked edema. This edema disappeared at the end of the fourth week, and without any loss of weight to the child. During the next two weeks this baby developed measles, so that the weight remained stationary for the following three weeks. During the attack of measles there was some indigestion, and the dose of citrate of soda was increased to 2 grains to the ounce of milk. When the child was on 2 grains of citrate of soda to the ounce of milk for some ten days, head sweating developed. At the end of two weeks the citrate of soda was diminished again to 1 grain to the ounce of milk, shortly after which the head sweating disappeared.

Cases 4 and 5 are twins, six months of age, two boys, one of which weighed 9½ pounds and the other 10 pounds. In these children it seemed necessary that they should be put on 2 grains of the citrate of soda to the ounce of milk. There was head sweating, with other manifestations of rickets. They were put on the citrate of soda grs. vj, and milk ℥iij, water ℥iij, for one week, increased to milk ℥vj, water ℥iij. By the end of the second week their digestive organs were in such a condition that the citrate of soda was reduced to 1 grain to

[1]Read before the Chicago Pediatric Society, March 20, 1906.

the ounce of milk, and the head sweating disappeared after about ten days or two weeks. There was very little difficulty with the larger boy. He took his citrate of soda and milk, and did fairly well from the start, while the smaller boy had more or less trouble. There were times when he had to be taken off of the milk entirely for two or three days at a time. This was done probably four or five times, before it was possible for him to take the milk as a regular diet continuously. He was one of our most discouraging cases. It seemed to me for a while as if I had found one baby that could not take milk, but by putting the child on cereal waters to rest the stomach we were able to continue the milk with the addition of citrate of soda. These two children were on citrate of soda for six months. Both are now above the average in weight for children of one year of age, and it has been unnecessary to use the citrate of soda for the last ten or twelve weeks, although if there is any disturbance of digestion the mother uses the citrate of soda in the milk for a day or two.

Case 6.—Baby girl; birth weight, 7½ pounds. Was first seen at six months of age, when child weighed 10¼ pounds. The diet from birth had been percentage modified milk. Bowel movements constipated. Physical examination disclosed signs of acute rachitis in head sweating—rosary—Harrison's groove, etc. Child cried and fretted continuously. Diet was changed to certified milk ℥iv, water ℥ij, sodium citrate grs. iv. This was increased gradually, so that by the end of the second week the diet was certified milk ℥vj, sodium citrate grs. vj. The sodium citrate was now gradually reduced at the end of the fourth week. The diet was certified milk ℥vij, sodium citrate grs. iv. In this child there was a rapid clearing up of the acute rachitis. The crying stopped, and there was a rapid increase in weight. After ten weeks' treatment there was a net gain of 7 pounds. The citrate of soda was discontinued. The constipation was easily overcome by olive oil ℥j at night for the first month.

Case 7.—Baby boy, ten months of age, a percentage modified milk fed baby, which weighed but 12 pounds. It was put on citrate of soda grs. vj and milk ℥vj, water ℥iij, increased gradually for four weeks, when diet was milk ℥viij, sodium citrate grs. viij. The citrate was now reduced gradually, being discontinued during the following month. The net increase in weight was 7 pounds in ten weeks.

Case 8.—A younger brother of Case 7, and is interesting in this respect. This infant is now about two months of age. This was one of the babies that regurgitated the mother's milk in large curds. I told the mother to give the baby citrate of soda grs. ij in a drachm of water after each breast feeding, and while the regurgitation did not entirely stop the curds were much smaller, and the amount regurgitated was much less.

Case 9.—Baby girl, eleven months of age, had been fed exclusively on oatmeal gruel. It could not take milk in any percentage modification. We added to the diet one feeding a day for the first three days of milk ℥iv, water ℥iv, sodium citrate grs. viij. The following four days we increased to two feedings a day. On the eighth day we began to feed this exclusively. At the end of the week the citrate was cut to 1 grain to the ounce of milk. The diet was then gradually increased, and in the next week the diet was whole milk ℥viij, sodium citrate grs. viij. This baby is now seventeen months of age, and it is impossible to discontinue the sodium citrate, as the bowel movements become green and foul after the first feeding of milk without the citrate.

There are a few points to be brought out in our observations concerning the use of citrate

of soda. We have made the rather arbitrary rule to give 1 grain of citrate of soda to the ounce of milk. This seems to be the proper amount to be used in the large majority of the cases we have treated, agreeing with the experience of Poynton. There are a few children, however, who cannot digest milk at first if only 1 grain of citrate of soda is added to the ounce of milk, and it is necessary for a week or two weeks to give more than 1 grain of citrate to the ounce of milk. These babies have been ill-fed before they come to us. They are brought for treatment—they are sick babies. They have shown a greater or less number of the phenomena of rickets, and it appears that where 2 grains of citrate of soda to the ounce of milk was given for any continued length of time, this being the sole diet of the child, we have had developed head sweating, so that I believe we should use as small an amount of citrate of soda to the ounce of milk as is compatible with the condition of digestion. The sweating does not necessarily mean rickets, for we know that most diuretics have a stimulating effect on perspiration. Where these children can digest milk with less than 1 grain of citrate of soda to the ounce of milk, I diminish the amount of citrate. The mothers give a history of increased urination in all these babies, and that this increase does not stop with the stopping of the citrate of soda. In children who have not had citrate of soda for the past nine months or a year, there is still increase in the amount of urine excreted per day.

Constipation is a factor in the feeding of citrate of soda and milk, as it is in all methods of feeding. This factor we have been enabled to overcome usually by the administration of a drachm dose of olive oil at bedtime.

Moderately High Altitude in the Treatment of Pulmonary Consumption.—

P. S. Jones (*Australasian Medical Gazette,* Aug. 20, 1906) says that in moderately high altitudes the red blood corpuscles are increased and there is a gain in digestive efficiency. Altitudes up to 8000 feet exercise a favorable influence upon the digestive processes. The oxidation of the body is increased even by altitudes as low as 1500 feet. In higher altitudes the oxidation processes are greater. Proteid metabolism and fixation are markedly increased in higher altitudes, particularly in the convalescent. The respiratory muscular mechanism is more energetically used and the heart's action is increased. Accurate observations show that the sense of well-being, which is felt at moderately high altitudes, is not simply emotional, but is dependent upon definite physiological processes. The action of these altitudes is to improve the health and strength of the body and thus aid in overcoming the tuberculous invasion.

The Treatment of Fetid Feet.—

Sabouraud (*Journal de Pharmacie et de Chimie,* July 16, 1906) recommends a 4-per-cent solution of chromic acid in distilled water in cases of profuse perspiration of the feet with foul odor. The solution is applied quickly with a pledget of cotton, care being taken that it penetrates between the toes. The application should be made each day for several days and then every second day following, and later once a week until the cure is completed. The lotion should not be applied twice on the same day lest it cause some erythema.

SPECIAL ARTICLES.

THE SOCIAL EVIL.

IV. CONTRIBUTING FACTORS (2).

Personal experience and observation combined long ago to impress us with the importance of books, pictures, and plays in exalting the sensual passions and so promoting the social evil. As, however, we were unable to uphold our opinions by any exact information we naturally hesitated to commit them to paper. Quite recently an effort was made to secure convincing evidence, but it unfortunately failed, for reasons that will shortly appear.

According to our notion *books* are read for pleasure and profit. Very few read for profit alone. The great majority read for pleasure and entertainment, and find it chiefly in works of fiction. Now fiction is a very comprehensive group, including writings that are humorous, writings that are imaginative, and writings that are romantic, and so appeals to different classes of readers. We imagine, however, that there are very few persons whose reading is largely limited to humorous writings, and we conceive children to be the chief patrons of the imaginative writings, so that we find the great majority of those who read books devoting themselves particularly to romance.

It seems as if the craving for romance is almost universal. Children begin it insidiously in their fairy stories, and it forms a strong undertone in the imaginative and humorous writings for adults. The taste for it grows rapidly under cultivation, and it is unfortunate that once it has developed it destroys the desire for other kinds of reading.

The scientific explanation seems to be found in the universality of love. The world is peopled with lovers. "All the world loves a lover," and so all the world loves to hear about lovers. The romantic vibrates a sympathetic cord in every breast. But the world of lovers is a very miscellaneous one, and the world of writers not unlike it, so that in the world of romantic books we have reflected, according to the talents and worldly wisdom of the authors, the loves of all classes, good and bad, high and low, moral and immoral.

The best writing is that which arouses the most intense sympathetic interest in the reader —makes him forget self and struggle with the hero, suffer with the heroine, and sigh with relief and satisfaction when at the end of the story the *finis* finds them happily folded in each other's arms. The more successfully the author succeeds in producing this imaginary association with hero and heroine as real people, and the more he makes the reader lose himself in the story, the better he is pleased and the more popular his book becomes.

So long as the author relates the story of heroes and heroines who conduct themselves according to the accepted moral standards, or still better soar to higher and nobler standards than society demands, so long the general tendency of the writing is good, though not without its influence upon the sentiments and passions. So soon, however, as the principal characters of the story transgress the limits of convention, and lapse toward the primitive state of love, the force of the writing is for evil, and the more the author condones their conduct the greater the harm done.

No good can possibly result from the relation of some tale, no matter how true in detail, in which a scoundrelly libertine is made to

court and win a virtuous girl. It represents and condones exactly the state of society most to be deprecated, and tolerates the conduct that is chiefly responsible for sexual immorality.

Women because of the comparative leisure they enjoy read more fiction than men. Young women are great readers of romance. If they were taught by their favorite authors that virtue in men was possible, and if the romantic hero was made to overcome temptation, and triumphantly claim his bride by the force of his virtuous conduct, the writing might be a little less true to nature, but a great deal more profitable.

We must consider another very important matter, namely, that the discriminative powers of the individual usually determine his selection of books. He naturally turns to those that appeal most strongly to his sympathies. From which it follows that the morally strong and intelligent man casts aside the unworthy book as worthless, while the morally weak and less intelligent eagerly reads it and is correspondingly influenced by it. If its tendencies happen to condone certain of his own vices, they are strengthened and moral injury done. Carlisle has aptly said, "My conviction gains infinitely the moment another soul will believe in it." So immoral tendencies may become fixed ideas through the influence of depraved literature.

That somewhat indefinite class of writings commonly designated "salacious" appeals most strongly to the morally weak and semiresponsible, to whom they must be extremely injurious. They are read, however, by many others of both sexes, and it is only necessary to appeal to your own personal experience with such books to satisfy you that they strongly stimulate the sexual appetite. Now if you, intelligent and morally strong reader, are influenced and excited by such reading, how much more will yonder foolish boy or irresponsible man be affected? What undoing of the resisting power of that frivolous, badly educated girl may not result from the emulation of heroines like those in the "Decameron"?

With these preconvictions and opinions in mind we set out to prove them by the help of statistics if possible, and began with an appeal to the librarian of one of the largest public libraries.

To our astonishment our requests for information, that seemed to us of the most commonplace character, changed the cordiality of our friend's manner to a frigid indifference, and we were turned over to an assistant who was instructed to help us if he could!

The explanation was that others had been ahead of us in our quest for information, and these others had been so numerous and so inquisitive that librarians all over the country are bored to death. There are a large number of philanthropically minded people who believe indiscriminate reading to be injurious, who believe public general libraries to be harmful, and who with the persistency of true reformers are continually poking their noses into the private affairs of the libraries in search of exactly the information we sought—proofs that more fiction, and more romantic fiction, is read than any other class of writings, and that books of shady character are most popular.

We were referred to twenty voluminous volumes of library reports, but nothing could be gleaned from them, since the classes of books most interesting to us were not clearly defined. We found out the reason for this in our conversation with the assistant librarian. It seems that librarians are sensitive and feel that discredit is thrown upon them as public educators

when too many books of the undesirable classes are taken from their shelves. They, therefore, do not sharply define such classes as "Fiction," "Literature," "Romance," etc., and by judicious occasional transfer of some of the "Fiction" into the class "Literature," make a much "better showing" in their annual reports.

We made a special inquiry about "salacious" books, but were told that there was no such class(!) The personal equation of the individual is the only criterion of salaciousness. Some readers find nothing objectionable in any book, others something objectionable in every book. There are some who would even include the Bible among the salacious books!

We did a mean thing, however, before leaving the library. We went to the catalogue and looked at the cards referring to the "Decameron," the "Heptameron," and the "Arabian Nights." There were no other cards in the catalogue so worn and soiled. There seemed to be at least two inferences to be drawn from this discovery: either these cards were referred to more frequently than their neighbors, or else the hands of those who do refer to them are as filthy as their thoughts!

So, after a sincere effort to support our theories by facts, we were obliged to give up the proofs, and trust to your believing that there is more fact than fancy in what we have said.

If it is impossible to secure accurate information as to the effect of books upon the emotions and passions, how much more difficult must it be to do so with *pictures*? So far as we know no attempt has been made to study the subject systematically or scientifically. Perhaps it is impossible to do so, yet we feel sure that pictures play an important part in stimulating the sexual feelings, and so become an adjunct in promoting the social evil.

The "Society for the Suppression of Vice" and Mr. Anthony Comstock fully understand this subject, and are zealously laboring to prevent the evil that obscene pictures may do. In this relation, however, we are confronted by the identical difficulty encountered with regard to books—*i.e.,* the definition of obscenity. What is art, what obscenity? If nudity is to be looked upon as synonymous with obscenity, then our public and private art galleries must alike be closed. The problem is a difficult one, and there is little wonder that the zealous reformer in this field of activity becomes so prejudiced as to appear fanatical and ridiculous at times. It seems to us that the solution of the difficulty is to be found in the psychic effects produced by the pictures.

Like authors of romance, artists tend to break through convention and the "outward show of things" and get "back to nature." It is a return to the primitive order of things. Costumes and habitations are the things of the moment—the human form divine, the rocks and rills, the mountains and the sea, the things of eternity. "Art is long." No artist paints or chisels for to-day.

In art as in romance there is personal equation in which the native disposition of the artist shines out. The products of the brush and chisel reflect the disposition of the individual.

Pictures may be compared to stories; nude pictures to salacious stories. There is no border-line between the proper and the salacious story, none between the nude and obscene picture.

"To the good all things are good." Those whose innocence or whose force of character defends them from evil see only beauty in the ordinary nudity of the art gallery, but even in this the inexperienced, the weak in character, and the naturally vicious find a disturbance of the emotional balance attended by an accentuated sexual inclination. And if this is true of

"gallery pictures," how much more true must it be of those whose vulgar obscenity makes their public exhibition impossible? Those whose acquaintance with the nude in art is limited to gallery pictures, mural decorations, and architectural details will not realize the force of these remarks so keenly as those whose observation extends to the vulgarly nude female pictures so highly esteemed as saloon ornaments in our Western States, to the lavish use made of nude pictures in houses of ill-fame, and the disgustingly vulgar obscenity of the "forbidden" pictures sold at the news-stands in some foreign cities.

The test of obscenity ought to be found in the psychic emotion the picture produces in the normal individual. If it is elevating, the picture is good; if depraved, it is bad. Border-line pictures should be classed as bad because of their effect upon the unintelligent and ill-balanced.

The *drama* has much to do with the stimulation of the emotions and passions, and in so much as these are of sexual character, just so much does it contribute to the social evil.

The drama is a wonderful combination of art and literature, doubly impressing the eye and ear of the spectator with the thought of the author. The intensity of sympathy aroused is such that the audience may be moved to tears or laughter by the player's art, and the illusion forgotten, the play seems real. It is impossible for such an impression to be without lasting influence, and the theater is more or less a school in which ideas are molded and character modified. If the plays are good, and the moral standards high, the effect is ennobling; if they are the reverse the effect is pernicious.

The great passions of human nature, love, hate, avarice, revenge, form the chief themes, so that the theater actually becomes a microcosm of human existence.

It is with the drama as with books: so long as they do not transgress the conventional limits and too closely approximate the primitive order of things, they are harmless; so soon as these limits are passed they become pernicious.

The theater furthermore attracts many whose acquaintance with books is small, and whose love of them is inhibited by the difficulty of choosing and reading them. It therefore affords entertainment for large numbers who are inexperienced, unlettered, unintelligent, and irresponsible, all of whom are doubly impressionable and more easily influenced for bad than for good. It is interesting to see how the melodrama and the burlesque appeal to these because of their superficial intelligence, and how the border-line joke affords them the greatest amusement. Shall we attribute this to their average character? If so, we must conclude that a large proportion of the population, whose characters are low in morals, and whose experience is limited, find great pleasure in an artificial excitement that cannot but react injuriously upon them. If this generalization is legitimate, might it not be allowable to particularize to the extent of believing that great damage may be done to those whose moral balance is not secure?

Of all theatrical performances we believe the ballet—one of the most beautiful—to be the most injurious, because of the sensuous impressions it produces. The performers—all women—are selected for their physical beauty, costumed so as to exhibit their charms as liberally as possible, and are made to engage in some semiallegorical representation the basis of which is usually that combination of passions already mentioned—love, hate, revenge, ava-

rice, murder. All this is enacted in the midst of a bewildering complexity of graceful movement, harmonious coloring, and melodious music that translates the spectator from the realm of the real to that of the ideal, and gives him a glimpse of a life without cares and without restraints, where love and everything else is free and all turns out well—undoubtedly a complete return to idealized primitive social conditions.

It is fascinating—a perfect poem of motion, color, and sound! But how many in the audience limit their thoughts to the conception as a whole? How many experience a pleasurable exaltation of sensuous passion? The reader is begged to answer this question for himself.

It is not all poetry. Why the joke about the "bald-headed" row? Why a scramble for the front rows when some famous danseuse is to perform? What are those half-dozen men in that box studying so carefully through their opera-glasses? Is it not *in all probability* the graceful outlines of those shapely female limbs, those dimpled arms, rounded shoulders, and swelling busts?

If any one doubts that sensuousness results from displays of this kind, and that sexual excitement is aroused in many who witness them, let him turn his attention upon the consequences of the performance to those who take part in it, and notice how the price of beauty exposed is, as a rule, virtue abandoned!

Should we incline to continue this, which the reader will undoubtedly be prone to look upon as a hypercritical survey of the subject, we could not omit saying something about the great danger of *promiscuous public dancing* by which individuals of opposite sexes of various moral and physical perfection are brought into close bodily contact; about the abuse of *spirituous liquors,* by which the sexual appetites are increased at the same time that the moral senses are obtunded, and about various other enjoyments usually looked upon as harmless.

But to do this would place us in the undesirable and disagreeable light of extremism and lessen the value of our opinions by arousing the suspicion that we are fanatics. Such is far from the truth. All that we have in mind is the forcible presentation of what seems to us an easily established—indeed, almost a self-evident—truth, that in most of our social intercourse, and particularly in our enjoyments, we experience a certain pleasurable stimulation of the sexual inclinations by momentarily neglecting the inevitable, essential, but somewhat harassing repressions to which civilized life subjects us, and that this excitation, which is harmless and perhaps even beneficial to those to whom legitimate gratification of the sexual passions is possible, is harmful for others less fortunate, in that they may become fired with a passion temporarily irrepressible, and led to seek illegitimate means of gratification.

BOOK REVIEWS.

PROGRESSIVE MEDICINE. Edited by Hobart Amory Hare, M.D., Assisted by H. R. M. Landis. Vol. 3, September, 1906. Philadelphia and New York: Lea Brothers & Co. Subscription price per annum $6.00.

William Ewart in discussing pulmonary tuberculosis says that the literature on the subject is now so vast that full justice cannot be done to it in an abstract of a few pages. The remainder of Ewart's communication is devoted to diseases of the thorax and its viscera, including the heart, lungs, and blood-vessels.

Gottheil has an excellent review of the progress in dermatology, perhaps the most important part being the discussion of the spirochæta of syphilis. He says that a review of the entire literature for the past year would be practically impossible, but he endeavors to give a synopsis of the subject based on Flexner's lecture and the original articles of Metchnikoff, Schaudinn, and Roux. He regards the inoculation experiments that have been made upon apes as quite conclusive evidence that the spirochæta pallida is the cause of syphilis. It is a discovery of the greatest scientific value, but as yet has but limited clinical application because of the difficulty of recognizing the spirochæta, requiring as it does high powers of the microscope.

Norris reviews the literature of obstetrics, dealing first with pregnancy and then with obstetric surgery, and finally discussing the puerperal period with the management of the new-born.

Spiller reviews the literature on diseases of the nervous system, beginning with an excellent résumé of the paper by Walton and Paull on brain tumor.

CLINICAL BACTERIOLOGY AND HEMATOLOGY FOR PRACTITIONERS. By W. D'Este Emery, M.D., B.Sc. Second Edition. Philadelphia: P. Blakiston's Son & Co., 1906. Price $2.00.

This little book undoubtedly fulfils the want of many practitioners who desire in small space to equip themselves with practical methods for completing their diagnoses by means of microscopical and bacteriological examinations. The fact that a second edition has so soon been called for shows how kindly the book has been received by those for whom it was intended. Many of its features are admirable, and a few are unusual. It is the first in which we have ever seen plates precede the text, and we believe this to be a good arrangement in that the reader, first looking at the pictures, acquires a more definite idea about that of which he subsequently reads. We are, however, in some doubt as to whether this arrangement is quite as ideal as having the illustrations inserted in the text so as to maintain a complete continuity of ideas. We suppose it is not a bad idea to give explicit directions concerning the choice of the microscope best adapted for clinical observation, but it seems to us rather remarkable that at this time, when so much is known about microscopes and the commonplace apparatus, a book of this size should contain no less than four illustrations of microscopes. We have read the directions for making culture media and for staining, and are of the opinion that one who follows them closely and intelligently cannot go astray. We regret that the author has omitted any mention or description of the very simple apparatus known as the "agglutometer," by which the typhoid fever agglutination test can be made without laboratory equipment or experience by any practitioner of medicine, and the convenience and cheapness of which should certainly recommend it. The subject of Bacteriology is treated purely from the clinical aspect. There are no special chapters devoted to the individual bacteria. It is all contained in the 166 pages, the remaining 70 pages being devoted to Hematology, in which a large part of the subject-matter deals with technique. Part III, comprising the few remaining pages of the book, has to do with diagnosis, and contains much of interest. The book is undoubtedly a good one, and we feel that it can be unhesitatingly recommended as one of the useful books that can find its way into the hands of the general practitioner.

MANUAL OF OTOLOGY. By Gorham Bacon, A.B., M.D. Fourth Edition, Revised and Enlarged. Philadelphia and New York: Lea Brothers & Co., 1906. Price $2.25.

The work opens with an excellent introduction by C. J. Blake, who deals with the importance of the era in clinical medicine, quoting approvingly the statement of von Troeltsch that to treat a child with one of the acute exanthemata without examining the ears is a most serious omission. Very nearly 25 per cent of the patients attending aural clinics are children under 14 years of age. Of this number 50 per cent are the subjects of suppurative inflammation of the middle ear, and of these 10 per cent or more owe their origin to the exanthemata of childhood. Twenty-seven per cent of deaf-mutes are due to suppurative middle-ear disease in early childhood. There is a condensed description of the anatomy and physiology of the ear, together with a quite adequate account of the more common aural affections. In a brief compass the writer gives the essentials of what the student of medicine should know in regard to diseases of the ear.

ABSTRACTS.

THERAPEUTICS.

Electrolysis in Strictures of the Eustachian Tube.— YATES, D. G. *New York Medical Journal,* vol. lxxxiv, No. 9, p. 426, Sept. 1, 1906.

It has long been recognized that a considerable proportion of all cases of deafness are due to narrowing of the Eustachian tubes. This stenosis may be caused by a thickening of the mucous membrane throughout the whole extent of the tube, or it may be at the junction of the cartilaginous or bony portions of the Eustachian canal or at the tympanic tubal orifice. Some years ago Duel placed a perfected technique of the treatment of these strictures by electrolysis before the profession. Since then some observers have been enthusiastic in their comments on this method, while others have been lukewarm. The following four cases illustrate the type benefited by this method of treatment:

Case 1.—C. S., a fireman, aged 30 years, presented himself with a history of fine high-pitched ringing in the ears which had persisted for over a year, following a succession of colds in the head. Deafness was slight and not an item of complaint. Shortly after the onset of the aural disturbance, fearing deafness, the patient had sought treatment at a clinic, and had his ears inflated by the Eustachian catheter twice a week for nearly a year. No improvement in the symptoms was experienced, but it was impossible to obtain a better inflation as time went on.

On examination the hearing was found slightly diminished, the ear drums somewhat retracted, and both Eustachian tubes uniformly and firmly contracted throughout their whole length. Treatment consisted in passing the electric bougie once in two weeks with one or two inflations in between. The current was used for about five minutes in each ear. For inflation a stimulating vapor of iodine, menthol, and camphor was employed. Improvement began to be noted in about two months, and gradually the tinnitus passed away, first absenting itself in the evening. Treatment was kept up with diminishing frequency for seven months. At the end of this period hearing was practically normal, and tinnitus had been absent for some weeks. There has been no relapse during the year that has passed since treatment ceased.

Case 2.—Mrs. S. V., housewife, aged 35, came for treatment of deafness and "stuffiness" in left ear. She had been hard of hearing for some time on the right side, but the present acute condition in the left ear alarmed her. The acute symptoms complained of were found to be due to impacted cerumen, and prompt improvement followed its removal. Both ears were then tested, with the following result: Right ear, watch one inch; forced whisper, fifteen feet. Left ear (the good one!), watch one inch; whisper, sixteen feet. Upon inflation with the catheter, it was found difficult to force air through the left tube, its walls being soft, swollen, and edematous. The drum on this side was slightly retracted and pinker than normal, and a diagnosis of hypertrophic O. M. C. C. was made. Tinnitus was present, but patient was not much annoyed by it. The bougie was passed at intervals of ten days, one treatment by inflation with the stimulating vapor before mentioned intervening. In two or three weeks the tube was well open,

the sounds heard through the auscultation tube nearly normal, and hearing so much improved that patient was content to stop treatment. On the right side the condition was of much longer duration, the drum much contracted, dead white and thickened, and the tube fairly patent. Here little improvement could be expected in such a short period, and little was had.

Case 3.—S. W., a physician, aged 45, had noticed gradually increasing deafness in his left ear during a period of about a year, with at times loud roaring tinnitus. The tinnitus had become very troublesome of late, and the deafness prevented the use of the ear in examining the chest or even in using the telephone. On testing it was found that the watch was heard only on contact, acumeter at three inches, and forced whisper fifteen feet. The drum was much thickened, opaque, and slightly retracted. The Eustachian tube did not seem to be markedly obstructed, although inflation was not thoroughly satisfactory. Treatment by inflation per catheter was kept up irregularly two or three times a week for several months, periods of relief from tinnitus and some improvement in hearing being obtained, but always relapsing on cessation of treatment. Finally the bougie was suggested and accepted. Tinnitus disappeared after the second treatment with this instrument, and has not returned for several months. The hearing distance was more than doubled in the following month, and the patient felt relieved from all symptoms, using the ear as before in physical diagnosis.

Case 4.—H. G., hotel keeper, aged 50 years. This man gave a history of marked deafness in both ears for over twenty years. The auditory disturbance appeared and reached its maximum in about a year. During this time he had a series of colds, and an attack of malarial fever for which he took large doses of quinine. During the succeeding years he continued taking quinine on and off for neuralgia. Examination of the ears showed both drums to be very much retracted and shrunken, presenting to the eye about half the normal area. Both Eustachian tubes were stenosed to an extent that I have never seen equaled in any other case. It was possible to get an occasional puff of air into the middle ear only when great force was used, when the catheter was crowded snugly into the tubal orifice, and when the patient made the effort of swallowing at precisely the right moment. He had been under treatment for months at a time, with many different specialists, and he stated that he had never before felt the air penetrate into the ear. It is a noteworthy fact that no one had attempted to employ the bougie, and no investigation of the tube had been made except the futile efforts to inflate with the catheter.

Hearing tests showed no perception of watch, acumeter, or whisper. The raised voice was heard two to three feet, but a good deal of dependence was placed on lip reading. Bone conduction was nearly normal on both sides. With such an amount of obstruction in the conductive mechanism, we would naturally expect greatly increased bone conduction. The test was therefore interpreted as showing a certain amount of labyrinthine involvement, due probably to the quinine. It therefore became a nice question as to how much improvement, if any, was to be hoped for as a result of opening up the tubes, and the partial restoration of the drums and middle ear to their normal condition.

Numerous sittings were required to penetrate the tubes with the bougie. One dense stricture was passed only to encounter another. On the right side the bony canal appeared to

be solidly filled up. Finally the tympanic cavity was reached, but the channel thus made promptly closed again. On the left side the condition was not so obstinate, and the tube was opened to practically the normal extent. The patient was then taught the use of the Politzer bag, and this was put into his hands to use night and morning. By this means he can now get the air into both ears, and the ultimate result is to about double the amount of hearing he possessed. Instead of being very deaf, he is now only "hard of hearing," and the difference thus expressed was a welcome improvement to a patient who has a business to carry on. The moderate tinnitus which he complained of was not influenced to any appreciable extent, and it is probable that his habits as to quinine may have done permanent damage to the labyrinth.

In all of the cases the indication was plain, which was to open up the Eustachian canal. Those who claim to achieve equally satisfactory results with hard-rubber or whalebone bougies have only done so where the strictures were near the mouth of the tube. Such large caliber bougies are particularly applicable in this situation. They are of little use in stenosis of the isthmus or of the bony canal. The electrolytic method is least satisfactory in strictures near the pharyngeal end of the tube which are somewhat similar to the urethra, for the cure of which strictures electrolysis has been largely abandoned.

For the benefit of those who may not be familiar with the technique, a brief description of the procedure is added. The apparatus consists of a gold wire, olive-tipped bougie attached by a cord to the negative pole of a galvanic battery of sufficient voltage to overcome the body resistance. Forty volts is strong enough. An ordinary hand electrode is connected with the positive pole of the battery, and grasped by the patient. The Eustachian catheter, insulated by winding with rubber tissue, is placed in position, and the ear inflated in the ordinary manner to make sure that the catheter is properly situated. The iodine, menthol, and camphor vapor is used in inflation, and is a valuable influence in preventing infection. The bougie is now passed through the catheter, and on through the tube as far as it will go without exercising force, and the current turned on until three to five milliamperes is indicated by the meter. No stronger current is necessary. The sensations of the patient must also guide the surgeon, for pain should be avoided. Having engaged the stricture, the bougie is allowed to lie snugly in contact with it for a few moments, when it will be found possible to advance the point a short distance. This maneuver is repeated until the stricture is passed and the surgeon is satisfied that the tube is open, when the bougie is slowly withdrawn and the current turned off. Often the patient will notice a fine crepitation while the bougie lies in contact with the obstruction, and this is taken to mean that the electrolytic process is going on satisfactorily.

Inflation should be performed before, but not immediately after, the bougie is used, for fear that air should be forced through a possible puncture of the mucous membrane into the loose surrounding tissues, and so set up a traumatic emphysema. Treatments with the bougie should be about ten days apart, with one or two inflations between.

The main elements of success with the method are time and patience. The surgeon must be prepared to devote from one-half to three-quarters of an hour to a treatment of this sort, and this has been a factor in rendering the method unpopular with some busy otologists. Where the requisite time is given and patience and care exercised in the technique, results are generally satisfactory and often brilliant.

Effect of Sterile Caseous Matter in the Treatment of Tuberculous Disease.—

PATERSON, P. *Lancet*, vol. clxxi, No. 8 of vol. ii, p. 493, August 25, 1906.

The condition which had led the writer to experiment with caseous matter in the treatment of tuberculosis is based on the fact that in the walls of tuberculous abscesses an abundance of tubercle bacilli are found, but comparatively few in their contents. He infers from this that some substance is produced in such an abscess that hinders their growth, as the other conditions of nutriment and temperature are favorable. The conditions which exist in an abscess as regards the relative proportion of caseous matter cannot be produced in the body as a whole, but it is possible that the introduction of a small quantity of this substance might exert a beneficial action on the disease. To use caseous matter of this kind it was necessary to destroy all the bacilli, which could not be accomplished by heating or chemicals without altering the chemical constituents of these substances. It was found that cold applied intermittently would produce the desired results. If tuberculous pus be kept in a refrigerator for five or six months, allowing it to thaw frequently during that time, the pus will not cause tuberculosis when injected into guinea-pigs. When the bacilli are destroyed by this means the serum is poured off and the sediment is washed for three days in a continuous stream of cold sterilized water to remove the soluble toxins. Sterile normal salt solution is then added to the fine white sediment until each cubic centimeter of the emulsion contains five milligrammes of solid substance, and the material is then ready for use. Large numbers of animals have been injected with this suspension, and in no instance has tuberculosis been produced. If a large quantity be injected into a tuberculous patient there is a well marked reaction. By such injections the opsonic index is rapidly raised. In one of the writer's patients the index rose from 0.5 to normal within 12 hours. The study of the opsonic index can only be carried out in a well equipped laboratory, but the writer has found that the temperature is a fair guide to the administration of this substance. He has used from 0.1 to 0.5 Cc. of the emulsion given every second day, and this was sufficient to raise both the index and temperature. He begins with a smaller quantity and increases the amount at each injection until a slight reaction appears. The following is a summary of several cases in which this treatment has been tried:

Case 1.—The patient was a girl, aged 8 years, with old-standing hip-joint disease. The joint was ankylosed and a sinus led from the outer side of the thigh up towards the joint. The skin round the opening of the sinus was extensively and deeply ulcerated. The sinus closed and the ulcers healed with four weeks' treatment.

Case 2.—The patient, a boy, aged 9 years, had tuberculous disease of the left clavicle, the left tarsus, and the right fibula. The left foot had been amputated and the fibula destroyed for about five inches before the treatment was commenced. When the injections were started there was a long open wound over the fibula and a sinus, discharging pus, over the clavicle. These were healed within five weeks after the injections were commenced.

Case 3.—The patient was a girl, aged 14 years, with disease of the synovial membranes of the wrist-joint which was discharging through two sinuses. After seven weeks' treatment the swelling had disappeared and the sinuses closed. The movements, though improved, are still restricted.

Case 4.—The patient, a woman, aged 22 years, had lupus of both cheeks of 12 years' duration. The patches were covered with

small superficial ulcers and the edges consisted of a zone of firm papules. These were healed after two months' treatment, though their outline still becomes red when the patient is excited.

Case 5.—The patient was a woman, aged 35 years, with chronic pulmonary tuberculosis. Both apices were diseased and with cavity formation. Cough was troublesome, expectoration was moderate in quantity, and bacilli were numerous. With three months' injections the symptoms have greatly improved. The râles have quite disappeared from the left apex and nearly so from the right. The cough is very slight and only for a little while in the mornings. There is almost no expectoration and the bacilli have been absent for two months.

Mercurial Injections in Syphilis.—

GOTTHEIL, W. S. *Progressive Medicine,* vol. viii, No. 3, p. 143, September 1, 1906.

Attention is again called to the injection treatment of syphilis, as the writer has frequently received communications showing that the method is not fully understood. His method has been frequently confounded with injections of the soluble mercurials, particularly bichloride. Save in the fact that both are means of introducing mercury into the system by means of the hypodermic syringe, there is no resemblance between them. Bichloride injections are painful and are liable to be accompanied by salivation, enterocolitis, and other undesirable effects. Being rapidly absorbed and excreted such injections must be administered daily or every other day. A course, therefore, means 25 to 50 injections. Such treatment may be efficacious in some cases, but they are unsuited for regular treatment in ordinary cases. They should be reserved for rare cases in which the luetic process threatens immediate damage or destruction to important parts or vital organs, and where neither the pain of administration nor the trouble and expense of the treatment are of importance. In using insoluble preparations a depot for the drug is made in the tissues, from which the salt, slowly converted into a soluble compound, is gradually absorbed. The injections need not be given oftener than once in one to three weeks. In rare instances the injections may be repeated as often as once in four or five days. Injections at weekly intervals is the best method of treating constitutional syphilis. The cost of such treatment is well within the reach of the majority of patients, and the injections occur at such intervals as a patient should be seen who is suffering from active syphilis. There is practically no pain from the salicylate injections if properly administered; a slight bruised feeling for a day or two is usually all that is complained of. As compared with inunctions the insoluble injections are cleanly, time-saving, and easy, and are less liable to show complications than other methods of administration.

The salicylate is by far the best of the insoluble salts of mercury to employ for hypodermic injection. It is superior to calomel as it is more easily incorporated in the oily menstruum. The salt contains 59 per cent of the metal, and it should be rubbed up in the proportion of 10 per cent with albolene. This makes an emulsion thin enough to flow readily through the needle, and each drop contains one-tenth grain of the salicylate, or about one-twentieth grain of mercury. The average dose is 5 to 7 drops, which is small enough not to damage the muscular tissue into which it is injected. The syringe may be entirely of metal, but it is better to have a glass barrel as then one can see exactly what he is injecting. The fluid has no action upon polished surfaces, and no chemical changes are formed even by prolonged contact with metal parts.

The needles should have sufficient length to reach through the skin and subcutaneous tissues even of stout people, so that the injections can be deposited in the depths of gluteal muscles. It is a mistake to make the injections subcutaneously. For thin individuals a three-fourths inch needle is long enough, but stout people with thick layers of fat require a needle over an inch long. The antitoxin size needle is to be preferred as it readily admits of the injection of the thick liquid. The injection fluid if once sterilized is not subject to the slightest change. It is best kept in half-ounce vials, which, with their corks, are first boiled and dried. The bottles are then filled with the suspension, plugged with cotton, and placed in a vessel filled with warm water up to their necks. This water is gradually brought to the boiling point and kept there for an hour. The plugs are then replaced by the sterilized corks, the bottles tightly closed and dipped into melted paraffin to seal them. They will then keep indefinitely. When the bottle has once been opened it should be exposed to the air as little as possible. The syringe can be resterilized by removing the oil with ether and alcohol. With a proper instrument this need be done but rarely. If the instrument is wiped with sterile cotton after use and kept in a tight box, and if the tip that enters the needle head, the only part of the syringe that is exposed to contamination, is passed a few times through alcohol flame before the instrument is used, all necessary precautions have been observed. Oxidation from the use of water in the presence of air and heat is what ruins needles. This does not occur with the oily fluid—in fact, the suspension is a preservative. The needles need not be boiled before use, but it is well to have a special one for each patient kept in an oblong pill box. Before using it is passed a few times through the alcohol flame, not heating it enough to destroy its temper. Whatever contamination there is on the outside of the needle simple brief flaming will remove. Handled in this way the needles last almost indefinitely. The location selected for the injection should be in the center of the gluteal mass, about midway between the intergluteal fold, and a line perpendicular to the great trochanter. The area is extensive enough to permit of at least three injections on each side at varying heights, so that it is six to twelve weeks before an injection need be given again at the same site. The needle should be entered at right angles to the surface and slightly from within outward. The injections should be given with the patient upright.

Dietetics of Obesity.—

CROFTAN, A. C. *Journal of the American Medical Association,* vol. xlvii, No. 11, p. 820, September 15, 1906.

The problem of obesity is the regulation of the diet and muscular exercise. These means can be reënforced by hydrotherapeutic and medicinal measures. The latter come chiefly into play in the symptomatic treatment of the complications of obesity. He quotes a German writer in classifying obesity into three degrees, the enviable, the comical, and the pitiable. The first practically requires no correction, the only effort to be made being to prevent its passing into the other stages. The other two require more or less active measures to cause a loss of fat. It is convenient, he says, to arrange three degrees of reduction cures. In the first, the caloric requirements are reduced to four-fifths of the normal, in the second to three-fifths, and in the third to two-fifths. Thus, in an individual normally requiring 2500 calories, the food should have a caloric value of 2000, in the second degree of 1500, and in the third degree of 1000 calories. The four-fifths diet is useful mainly in preventing the increase of fat in persons inclined to obesity. It is suitable for continued use, is easily borne,

and requires no special calculations. It is usually sufficient to allow meat only once a day, to reduce the amount of starchy and sweet foods somewhat, to restrict or to forbid alcoholics, and to limit the liquid intake generally to from one to one and one-fourth liters daily, using also filling food of small caloric value. The second degree is also suitable for continuous use and should be adopted for strong, fat individuals who cannot at once stand the third degree of reduction cure. This last, when taken, should be under the supervision of a physician and in an institution. Unlike the other two the weight reduction is rapid, and it is specially dangerous in very young or old people. The popular banting cures, etc., are of this type and therefore dangerous and to be condemned. The question as to the amount of each food constituent in reduction cures, proteid, fat, or carbohydrate, is discussed, and the general rule laid down that the individual should receive an amount of albuminous food incorporating from 60 to 80 grammes of albumin to keep up the nitrogen equilibrium and to protect the tissue albumins. The remaining number of calories required may be supplied by carbohydrates and fats, the former especially, if they are voluminous, being given the preference. The restriction of liquids to one or one and one-half liters a day is of value, but its effects are not of themselves permanent. The special articles of diet are mentioned. Alcohol should be included in the calculation if used. It should be allowed to patients who have been accustomed to it so as not to rob the heart at once of its accustomed stimulus. Lean meats, plainly prepared—that is, roasted, broiled or stewed, without rich sauces or gravies—are preferable. Milk is useful provided its caloric value and water are estimated. Thin soups are useful, for their caloric value is practically *nil*. Articles made of flour or rice, except bread in small quantity, carefully weighed and its caloric value calculated, and small amounts of potatoes, may be allowed in the first and second degrees of reduction cure. Vegetable foods growing underground or in pods are useful. They should be served only boiled in salt water, without the addition of butter, flour, or cream. The indiscriminate use of mineral waters is condemned by Croftan, though they may have a certain psychologic value. These patients often do well at mineral springs and cures, but the good effect is mainly due to the regulated diet, which the patients undergo more willingly at a watering place than at home.

High-frequency Currents in the Treatment of Small Benign Neoplasms and Hypertrophies of the Skin.—

RANKIN, J. T. *Archives of Physiological Therapy*, vol. iv, No. 3, p. 125, September, 1906.

High-frequency currents have been used as an adjuvant to the Roentgen and Finsen rays in the treatment of malignant neoplasms and lupus. In small localized hypertrophies and benign neoplasms there is a field for high-frequency currents which, while it may not supplant other methods, will give excellent results. High-frequency currents are useful in the removal of warts, freckles, pigmentary and vascular nevi. The scar left in these cases is scarcely perceptible, though for some weeks after the treatment there may be more or less pigmentation. The current which the writer has used is derived from the Oudin resonator energized by an induction coil carrying from one and three-fourths to three amperes of current through the primary and interrupted by a mercury jet break. The electrode was the ordinary needle-holder for electrolysis carrying a pointed copper wire, some being sharp and some blunt according to the spark desired. The electrode must be insulated with heavy, hard rubber tubing. The current passes by one wire to the extremity of the resonator drum, the

monopolar method. In making the applications the part to be treated should be cleansed and bathed in an antiseptic. The part to be treated is pressed between the thumb and finger of the operator's left hand and the electrode brought within a few lines of the part. A mild current is then passed through the apparatus, and after a few seconds a stronger current, the point of the electrode being gradually withdrawn until a spark varying from 1 to 2 cms. is obtained. The distance must be regulated by the tolerance of the patient and the rapidity of tissue destruction. The first action of the spark is to cause a contraction of the blood-vessels or an anemic condition. This is quickly followed by a dilatation of the vessels and a reddening of the affected area. When the part treated is vascular there is an oozing of a yellowish or reddish-brown serum. Soft, non-vascular warts become quickly blackened or shriveled and there may be little or no oozing. In treating vascular nevi measuring from 2 to 4 cms. one-fourth or one-half of the involved area may be treated at first. A heavy yellowish or brownish scab forms over the part which the spark has bombarded, this scab falling off in six to ten days. When the scab falls off the site is smooth and on a level with the surrounding skin. The smaller marks, those ranging up to one and one-and-one-half centimeters, may often be destroyed in from one to three treatments. Lentigo and cholasma should be treated with a short, fine spark, continued until there is a faint shriveling of the skin and a slight oozing. The treatment should not be carried too far in anemic patients. Soft, warty growths may be treated until they turn brownish or brownish-black, one application being generally sufficient in these growths. The firmer warty growths require more vigorous sparking and often need treatment several days in succession. On hairy nevi the action of the spark does not extend deep enough to destroy the hair follicle, so that the needle is often required to complete the obliteration. The high-frequency current has a favorable influence upon thickened and discolored scar tissue. Care should be taken not to use too heavy a spark around the eyelids or around or over superficial veins.

Internal Antiseptic Treatment of Tuberculosis.—

MALONE, H. H. *Journal of the American Medical Association,* vol. xlvii, No. 10, p. 739, Sept. 8, 1906.

The writer proposes an antiseptic treatment of tuberculosis. The drugs he would employ are iodine and phenol, the latter lessening the irritating action of the former and permitting the use of larger doses. Both, he claims, also promote constructive metabolism under proper conditions. The irritating and caustic properties of phenol can be materially lessened by proper dilution and still further by the action of camphor, and by gradually increasing the dose, he says, much larger doses may be given to advantage than the authorities would lead us to believe. He mentions a dose of 14 grains every two hours, given by Wigglesworth in influenza and by Atkinson in plague, but he prefers to give smaller doses in the beginning and gradually increase as tolerance is acquired. The formula which he has himself successfully used is given as follows: Phenol and tincture of iodine, each 160 minims; spirit of camphor, 3½ drachms; glycerin, c. p., ½ ounce; and equal parts of cherry-laurel water, cinnamon water, chloroform water, and tar water to make 15 ounces. Mix and allow to stand until all free iodine disappears. Then make an emulsion by adding one ounce each of cod-liver oil and powdered acacia. Begin by giving one teaspoonful in half a cup of water every four hours, and gradually increase the dose to a tablespoonful at one-hour intervals. Variations can be made on this according to the requirements; much depends on the technique in

the management of each individual case. While not speaking positively as to the action of each of the principal ingredients of the above, Malone thinks there is a combination of direct antiseptic action on the bacilli, with a favorable influence exerted, particularly by the iodine and camphor, on phagocytosis and other protective agencies of the living body. The leucocytes are increased in number, and symptoms indicate neutralization of toxins or inhibition of their formation. The tubercle bacilli are more deeply stained by carbolic fuchsin in the sputum of patients under this treatment. A detailed report of his results is promised in the future, but they have been so satisfactory as regards disappearance of the bacilli, increase of weight, and of apparent arrest and cure in some even advanced cases, that he is induced to place the method before the profession.

Treatment of Duodenal and Gastric Ulcers.—

LAMBERT, A. *Journal of the American Medical Association,* vol. xlvii, No. 11, p. 845, Sept. 15, 1906.

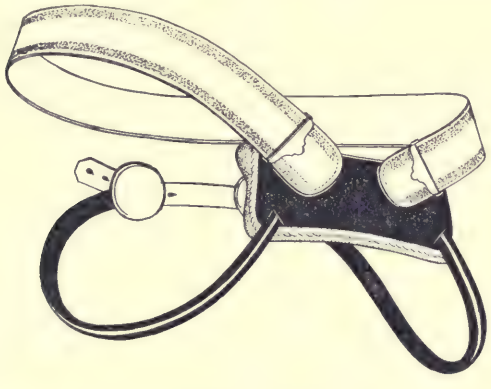
When medical treatment is considered desirable in gastric or duodenal ulcer, the first essential is complete rest for the body and stomach, which implies rest in bed and rectal feeding, followed by milk diet. The length of time necessary for the patient to remain in bed varies from a week or two to several weeks, according to the severity of the case, and the rectal feeding should continue from three or four to ten days correspondingly. Gastric feeding should be begun before the rectum becomes intolerant, and as the amount given this way is increased that by the rectum should be decreased. Peptonized milk at long intervals should be the first food, and at the end of the week the patient should be getting a quart in 24 hours, with the rectal feeding discontinued. It should then be gradually increased up to two quarts a day, and it is safe to begin to reduce the peptonization and to use cooked cereal gruel as part of the diluent. At the end of the fourth week the patient may be taking raw milk, and in the fifth and sixth weeks can gradually return to a light, unirritating natural diet. During the bedfast period the patient should receive daily alcohol spongings and baths and light massage, avoiding the abdomen. Some unirritating iron preparation may be given if necessary. To insure against relapses the patient should be instructed to use an unirritating diet and mode of life, avoiding overexertion, alcohol, highly-spiced foods, and anything that will irritate the stomach. Large doses of bismuth subnitrate are recommended before meals. The Lenhartz protein diet is mentioned and described. Special mention is made of two methods of drug treatment: the Fleiner bismuth cure and Cohnheim's olive oil treatment. The objections to them are the use of the tube, which the author thinks is not always essential and can be used safely with due precautions. In cases with hemorrhage, however, it is decidedly contraindicated. The serious complications of ulcer are perforation and hemorrhage, and the former is always a matter for surgical treatment, and the latter, if severe; the patient should not look on the surgeon as the last resort. While the results of medical treatment are not altogether favorable, the acute cases in young individuals have a high percentage of actual cures. In hemorrhages, medical treatment offers more chances than surgery. Leube's indications for surgical interference are sound: "1. Repeated, little, unceasing hemorrhages, sapping the vitality of the patient, absolutely indicate early surgical interference, and all the more so if stasis is also present. 2. A simple profuse hemorrhage is not a surgical indication. But if it is repeated, an operation is relatively, not absolutely, indicated. An operation is only indicated if the pulse and general condition of the patient justify it." In skilled hands the mor-

tality of gastric surgery for ulcer is to-day about the same as in medical treatment without surgery. Physicians cannot adopt enthusiastically a surgical point of view until the best operation and its technique is more generally agreed on, and we have more statistics of final results.

Abdominal Supporters.—

HARTZ, J. F. *Detroit Medical Journal,* vol. vi, No. 9, p. 301, September, 1906.

The purpose of this communication is to call attention to the value of mechanical support and to illustrate a new form of abdominal supporter. A similar supporter was devised many years ago which consisted of a flat steel plate; this was fixed with springs which passed over the crest of the ilium to a pad on the back. This instrument was replaced by German in-



ventions, principally by that of Teufel. The supporter devised by the writer consists of a pad enlarged at the base to produce pressure immediately over the pubes. The band encircling the body is made of strong elastic webbing and can be arranged so that it exerts a light or strong pressure which can easily be adjusted by the patient. Supporters of this kind have been used for many years in anteversion of the uterus, and similar mechanical supports are now used in gastroptosis. The supporter devised by the writer is of medium price and is especially adapted for floating kidney. A difficulty with most patients affected in this manner is that they are usually thin, and in order to get sufficient compression it is necessary to use perineal bands. These are unpleasant and unsanitary. The necessity for these perineal bands is overcome by having an additional body band two inches in width to encircle the pelvis below the gluteal muscles which will hold the front plate in position without difficulty. The springs can be adjusted to lie snugly above the crest of the ilium, and these prevent the pad from sliding downward. Supporters of this kind are not applicable to fleshy individuals, the indications in such patients being met better by a firm silk or cotton elastic abdominal supporter. This prevents undue jarring, hernia, and the pressure tends to lessen the accumulation of fat. The support which the writer has devised is useful in floating kidney and gastroptosis or any combination of these conditions. It is useful after abdominal operations to support the cicatrix and prevent ventral hernia. It is also useful in cases where the abdominal muscles are weak and there is a strong predisposition to hernia.

Treatment of Blepharitis.—

HARMAN, N. B. *Clinical Journal,* vol. xxviii, No. 23, p. 359, September 19, 1906.

The subjects of this affection are most frequently possessed of skin and hair which are both thick and greasy, and they either suffer from or are liable to blackheads, pustules, acne, and seborrhea. Such conditions furnish a favorable soil upon which a refractive error will lead to more or less chronic inflammation of the lids and the development of those pyogenic organisms which are always present in the margins of the lids. The defect in vision may be very slight, but when the child is put to close and difficult work, especially when from unhealthy general conditions of

life fatigue is readily induced. This tiring of the eyes leads to a suffusion of tears, causing blinking, which mechanical irritation prepares for the implantation of the infection usually in the hair follicles. To cure these cases is not difficult, providing it is done in time. The crusts should be carefully removed from the lids, using for this purpose a simple alkaline solution such as bicarbonate of soda, together with plenty of soap and water. It is well for the surgeon to clean them himself, and finally apply a little swabbing of a weak solution of silver nitrate. Then a smooth antiseptic ointment can be used, which will keep the lids soft and lessen the crusts and scabs. Plain boric ointment in yellow vaselin, or a doubly diluted ointment of ammoniated mercury, or a yellow oxide of mercury in lanolin and vaselin, are all of value, the last perhaps most of all. A careful refraction is of course essential, and in those who have thick, greasy skins scrupulous cleanliness and regular bathing is of the utmost importance.

A Possible Danger in the Use of Osmic Acid.—

HERTZLER, A. E. *Medical Record,* vol. lxx, No. 10, p. 380, September 8, 1906.

The writer calls attention to a recent report of hematuria following an injection of a solution of osmic acid for neuralgia. Osmic acid in common with several other minerals causes a definite reaction with recent or living tissues. Silver nitrate has been definitely worked out. It produces a chloride with the tissues, a substance which is harmless by the mouth but is quite poisonous when injected intravenously. With osmic acid the reaction is more difficult to trace, but it undoubtedly forms particles in the tissues which may lead to emboli in the kidneys. It is probable that the small amount of osmic acid used in the treatment of neuralgia is not great enough to jeopardize the life of the patient.

Adrenalin in Exophthalmic Goitre.—

BARCLAY, H. C. *American Practitioner and News,* vol. xl, No. 7, p. 366, July, 1906.

A young woman who was under the writer's treatment for pulmonary phthisis developed exophthalmic goitre. The lung signs diminished, but the tachycardia and other symptoms became more serious. Under the usual treatment there was no improvement. One morning he was sent for hurriedly, and found the patient suffering from severe palpitation and the pulse uncountable. Five minims of a 1-in-1000 solution of adrenalin chloride was injected, which was followed by an immediate improvement in the heart's action. The pulse at once slowed, and soon the sense of impending suffocation passed off. In fifteen minutes the patient was quite comfortable. The patient was kept under adrenalin for a couple of months with a complete cessation of the exophthalmic symptoms.

An Anticholera Serum.—

MACFADYEN, A. *Lancet,* vol. clxxi, No. 8 of vol. ii, p. 494, August 25, 1906.

The experimental work performed by the writer shows that from the cholera germ by certain methods toxic cell juices can be obtained which show active immunizing properties, also that an antibody can be produced from this primary poison which is found in the cholera bacillus. This anti-endotoxic power of the serum can be raised to a marked degree. Such a serum contains agglutinative and bacteriolytic properties.

Larger Doses of Antitetanic Serum in Tetanus.—

ENGELMANN, R. *Medical Record,* vol. lxx, No. 12, p. 453, September 22, 1906.

The writer believes that the ineffectiveness of antitetanic serum in cases of tetanus is due to insufficient doses. In the case, the history of which she reports, the writer administered the

serum by both intraspinal and subcutaneous injections to the amount of from 60 Cc. to 80 Cc. daily to begin with, the total amount being 650 Cc., of which 520 Cc. was given subcutaneously, 85 Cc. subdurally, and 45 Cc. directly into the wound. After five days of this treatment the man was comfortable, with flaccid muscles and less rigid jaw. Recovery took place in four weeks, and at the end of six weeks the patient was back at work.

THERAPEUTIC BREVITIES.

Dry Hot Air in Frost-bite.—

F. S. Skiff (*Archives of Physiological Therapy,* September, 1906) was called to treat a man who two days before had frozen his feet. All the toes of both feet were apparently lifeless, and there was little sensation in the anterior half of each foot. For three days hot bichloride packs were employed, and then dry hot air applications were substituted, a temperature of 140° to 150° F. being employed, each treatment lasting an hour to an hour and a half. After each application the subjective feeling in the feet was greatly improved, the circulation gained, and sensation was gradually restored. There was extensive desquamation, and ultimately a portion of both great toes was lost, but it is believed that the major portion of the feet and the other toes were saved by the dry hot air applications.

Sterilization of Catgut by Benzine.—

Kendirdjy (*Repertoire de Pharmacie,* July 10, 1906) says that the most satisfactory way of sterilizing catgut is to expose it to the vapor of benzine at a temperature of 120° to 130° C. Five successive exposures of an hour each will destroy the most resistant microörganisms and all spores. By this method neither the strength nor the flexibility of the catgut is in any way affected.

MEDICINE.

Landry's Paralysis.—

MACNAMARA, E., and BERNSTEIN, J. *British Medical Journal,* No. 2379, p. 248, Aug. 4, 1906.

The writers report a typical case of Landry's paralysis in which eventually complete recovery took place. There was a gradually ascending flaccid palsy, and on the eleventh day ocular movements were impaired. From that time on there was a slow remission. The following is a history of the case:

W. H., aged 30, waiter, admitted to the Westminster Hospital on August 3, 1904.

Previous history. Had had syphilis at 24, and thereafter thorough and prolonged treatment. Had had no other previous serious illness. Had not drunk to excess. Usually smoked one ounce of tobacco a day.

History of present illness. Quite well up till eleven days before admission; at that time the legs began to get weak, and in three days' time loss of power in them was complete. For three days before admission patient had been gradually losing power in the hands, and for one day had had double vision and difficulty in swallowing. For first three days of his illness patient's legs had ached. There had been no numbness or paresthesia, and no headache or backache. The bowels had been constipated, and there had been some difficulty in starting micturition. There had been no incontinence.

State on admission. The patient was well nourished and of a good color. Mentally he was markedly intelligent. Special senses of smell, taste, and hearing were normal. Vision of R. eye 6/24, of L. 6/18. Visual fields were normal; optic disks normal.

Outward movements of both eyes were incomplete in range. There was no nystagmus. The left pupil was a little larger than the right, and both were almost immobile to bright light. There was slight ptosis of the left eyelid. There was no obvious affection of parts supplied by the fifth and seventh nerves. The left half of

the soft palate drooped more than the right and moved less completely.

The tip of the tongue on protrusion deviated to the right and its lateral movements were feeble. There was slight difficulty in pronouncing the lingual and guttural sounds.

There was no movement at any of the joints of the legs or feet, with the exception of the right first metatarsophalangeal joint; here the big toe could be feebly flexed and extended. The leg, if lifted and dropped, fell flaccidly and presented no passive resistance to the movement of its joints.

The patient could not sit up, though the abdominal muscles could be felt to contract on his attempting to do so. The movements of the upper extremity were very feeble. The thumbs and little fingers could not be approximated, and the fingers scarcely abducted or adducted.

Flexion of the head was very feebly performed, but lateral movements of the head were fair. Respiratory movements were good. The anal sphincter was very lax.

There was nowhere any sign of tremor, fibrillation, or rigidity. The various muscles felt flabby, but did not seem to be wasted. The coördination of movements, where any could be performed, was good.

There were no sensory changes, objective or subjective. No reflexes could be obtained from the lower limbs. The abdominal, cremasteric, and epigastric superficial reflexes were normal, as were also the triceps and supinator jerks. There were no trophic or spinal changes.

A faint apical systolic murmur was heard, but otherwise the thoracic and abdominal organs presented no abnormal physical signs. The spleen was not enlarged. The urine showed no abnormality.

Progress. Up to August 8 the movements of the limbs and trunk remained much as described above. On that day the emotional movements on the left side of the face were noted to be not quite so good as on the right side; forced movements were equal on the two sides. The ptosis of the left eyelid was more pronounced. The abdomen was rather distended. On August 10 the hand grips were slightly stronger and speech a little more distinct. The patient complained less of diplopia. The left pupil reacted to light more rapidly than the right. Both pupils just reacted to painful stimulation of the skin of the neck, but did not accommodate. The triceps and wrist jerks were less brisk than before. The abdominal, cremasteric, and epigastric reflexes could not be elicited.

By August 15 the patient was again able to swallow solids, the ocular movements were better, and the hand grips still stronger.

On August 25 slight power of flexion and extension at the ankles returned; the legs, also, could be slightly flexed upon the trunk and abducted and adducted.

By September 3 both pupils reacted well and equally. There was no ptosis, and ocular movements were through a normal range, but there was a little nystagmus on extreme lateral movement. There was no further complaint of diplopia. The patient could sit up in bed, using his arms to raise himself up. All movements at all the joints of the legs could be feebly performed. The knee-jerks and ankle-jerks seemed normal. The flexor response was present on both sides.

Result. By September 17 the patient was walking with the help of sticks, and shortly after left the hospital.

The temperature had been observed to be elevated to 99.4° F. on the day of his admission; thereafter it had been normal. On August 9 the electrical reactions were reported as showing some diminution to faradism, and on September 14 some increase. There was no reaction of degeneration. Drug treatment had consisted in the administration, during the early stages, of potassium iodide. From August 21 onward massage and electricity were

used. The patient was last seen in May, 1904, when he had almost wholly recovered. He could then walk perfectly well on the flat, but experienced a little difficulty in going upstairs.

In this case an organism was obtained from the cerebrospinal fluid which bears a close resemblance to one isolated by Buzzard. The writers conclude that this organism cannot be definitely pointed out as the cause of the symptoms, but that it actively existed in the cerebrospinal fluid is positive, and the association is significant.

Post-typhoid Periostitis and a Typhoid Spine.—

WILSON, C. J. *Medical Chronicle;* vol. xi, No. 5, p. 280, August, 1906.

During the past ten years in the London Hospital out of 1618 cases of typhoid fever there occurred 15 cases of periostitis. These figures do not fairly represent the frequency of this complication, as some of them may have been so slight as to have escaped notice, or it may have appeared after the patients left the hospital. Both lesions are more frequent after typhoid than after other continued fevers. From the cases observed at the London Hospital the writer constructs the following composite description:

The patient is convalescent from an attack of typhoid fever; about two or three weeks after the fall of the temperature to normal he complains of sharp, shooting pains over the crest of the tibia of one leg; perhaps the first time he noticed the pain was when he first began to walk. The pain continues, and two or three days later, when the leg is examined, there is found a small node on the bone, which is very tender to pressure. Still later this node becomes red and hot, and eventually fluctuation is detected. If now an incision is made into it pus is found underneath the periosteum; the evacuation of the pus immediately relieves the pain, which until now has been severe, but an intractable sinus persists. At the bottom of the sinus is bare bone; the surrounding tissues are red, swollen, and tender, and a purulent or serous discharge persists for an indefinite period. The more complete operation of scraping away all affected tissue, with removal of any necrosed bone, is followed by obliteration of the wound by healthy granulations.

Out of 20 cases the tibia was affected in 9, the ribs or costal cartilages in 4, the femur in 3, the metacarpus in 2, the humerus in 2, the skull in 2, the clavicle, ulna, and a phalanx of the toe each in one. There may be multiple involvement. In the majority of cases the disease does not lead to suppuration. In these a tender swelling appears which either subsides or persists indefinitely as a node. Pus was found in one-half of the cases, but this proportion is probably too high, as non-suppurating osteitis of only a few days' duration may be overlooked. The periosteal node may continue as such for a long period and then suppurate, in one instance after eighteen months. As a rule the periostitis is accompanied by a rise of temperature. Generally the periosteal complication comes on after the fever has subsided. In two of the London Hospital cases cultures of the typhoid bacillus were obtained one week and one year respectively after the termination of the fever.

A study of the recorded cases of typhoid spine shows that it is most common in males and begins by a weakness and aching in the back, often complained of when the patient first sits up. The pain increases in severity, and in some cases even becomes more severe than in Pott's disease. The average duration of acute symptoms is four and one-half months. The physical signs are not pronounced. There is tenderness mentioned in 16 out of 26 cases, and swelling of the soft parts in seven cases. In 11 of the cases there was some spinal deformity, and in about half there was an irregular temperature. The writer does not agree

with Osler's view that the majority of these cases are neurotic. He says that the six cases described by Osler are not typically typhoid spine. The chief difficulty of regarding it as a periostitis is the fact that so far no case of typhoid spine has been complicated by suppuration. The treatment consists of rest in bed with fixation of the spine by some mechanical contrivance. Counter-irritation and massage are of service in the later stages, but in the acute onset they are probably harmful.

Subacute and Chronic Seminal Vesiculitis.—

WILTSE, J. W. *Albany Medical Annals,* vol. xxvii, No. 9, p. 619, September, 1906.

Lloyd first described seminal vesiculitis as a distinct entity in 1889. Two years later he showed that it frequently had its origin in gonorrhea, a condition which is now well recognized. The simple or catarrhal form, which is often looked upon as a neurosis, is the subject of the writer's thesis. Cases of vesiculitis occur in which there is no history of gonorrheal infection. An analysis of the published cases shows a considerable proportion not due to gonorrheal infection, and some of them were very severe. In subacute vesiculitis the inflammation is largely confined to the mucous coat. The secretion is not altered to the degree seen in the chronic form, being largely mucoid and containing comparatively few leucocytes. In this form of the disease the contents of the vesicles are not much increased and the vesicle is not greatly distended. Subacute vesiculitis, according to Fuller, is often associated with an atonic condition of the wall of the vesicle. In such cases there may be marked accumulation of fluid not due to inflammation, but to relaxation of the structures. In chronic vesiculitis the deeper structures of the vesicle are involved, and the pathological changes extend to the muscular coat and may even extend beyond the walls, constituting perivesiculitis. The vesicles in this form of the disease are usually distended and the walls thinned and fibrous. The vesicle usually contains a considerable amount of mucopurulent secretion. If the inflammation around the vesicle is severe there may be actually a contraction due to the development of fibrous tissue. The commonest cause of vesiculitis is an infection which extends along the ducts, though the possibility of the colon bacillus passing directly from the bowel to the vesicle is to be taken into account. Apparently sexual abuses may lead to a catarrhal vesiculitis, though the disease does occur in fairly continent men who are neither vicious nor ignorant. Many of these cases are passed along as sexual neurasthenics without proper examination. Alcohol and tobacco may be exciting agents, but a common cause is bicycle riding. Horseback riding too may also produce the disorder. Of the writer's eight cases six were bicycle riders. One of them presented a history of a severe trauma to the perineum.

In all of the cases there was no history of venereal infection. Frequent urination and decreased or lost sexual power were characteristic of all the cases. There was pain or a sense of discomfort and uneasiness present in almost all cases. In many cases pain is a distinct symptom, usually referred to the bladder or its vicinity, though reflex pains may have a distant seat. Pain does not always seem to be commensurate with the amount of disease found. Besides pain there is thickening or sclerosis of the vesical wall, distention of the sac, a feeling of bogginess to the examining finger, fluctuation when the sac is distended. Urination may be more frequent, and there is often a burning sensation felt at the vesical neck when urine is passed. Urethral tenesmus is not uncommon. The main reliance in the

diagnosis must be on palpation; with the patient in proper position and under proper conditions the vesicles can be readily felt.

In treating the condition stripping the vesicles is about the only remedy that is of service. To do this properly the bladder should be well filled and the patient should be standing with the feet moderately apart, the hands resting on a chair with the body at right angles. In this position the operator's left hand presses the bladder downward into the pelvis, in this way bringing the vesicles within the reach of the finger placed in the rectum. The examining finger first feels the base of the prostate, and is then pushed forward and to the side of the prostate until the junction of the vesicle and prostate is felt. The vesicle is then followed as far toward the posterior extremity as possible. The contents of the sac are then forced ahead of the finger through the duct into the prostatic urethra. This motion is repeated several times, depending somewhat upon the degree of tenderness and pain produced. As improvement takes place the force used may be increased and the duration of sittings lengthened. As a rule from three to five days should elapse between each treatment. Many patients will need no other treatment. It will not cure all cases, as in some the vesicles are so badly damaged that operation must be resorted to.

Induction of Hypnosis.—

ASH, E. *Lancet,* vol. clxxi, No. 8 of vol. ii, p. 501, August 25, 1906.

Attention is first called to the writer's failures in attempting to induce hypnosis in nervous patients. In this class the phenomena of hypnosis are produced with greater difficulty than with those who are in perfect health and who are capable of fixing their attention at will. It is advised that a beginner should choose subjects of this sort. In common with other writers he divides hypnosis into three stages:

1. A condition of drowsiness and inability to open the eyes when forbidden to do so. 2. A dream-state in which various ideas suggested appear to the subject as if in a dream or picture. In both these stages the subject is quite aware of his surroundings and that he is being made the center of an experiment. He feels lethargic and disinclined to move and that he cannot move his eyelids or limbs when told not to do so by the operator. 3. In the third stage the attention has been so completely distracted from present surroundings that the subject has fallen into a condition of sleep. In this state he is peculiarly amenable to suggestion, will talk when spoken to, and will describe various hallucinatory scenes that are suggested to him, and may walk about and take active part in these imaginary scenes. This is what is described as somnambulism, and is a condition in which an infinite variety of hallucinations may be suggested. When complete the subject has no subsequent recollection of his hallucinations. A characteristic condition that can usually be produced in almost any stage is that of catalepsy; if the subject's attention be directed to any limb and it is suggested that the limb is becoming stiff an extraordinary rigidity will result, of variable duration, and for the time being quite preventing any voluntary movement of the limb affected.

It is obvious that a beginner cannot expect to produce all these stages in his early experiments, but he should be content if he produces a slight impression on the subject; later, as the latter becomes accustomed to the process, the deeper stages can often be obtained. To produce hypnosis the subject should sit in a comfortable position involving no muscular constraint, particularly of the neck. At the word of command he is to close his eyes and not to analyze his sensation, nor to resist the

feeling of loss of contact with his surroundings. The thumb of the right hand is placed in the center of the subject's forehead, resting the fingers in the left temporal region. Then the thumb is passed firmly down the forehead over the root of the nose, this pass being repeated several times, after which the suggestion is made that the subject cannot open his eyes. At first there will probably be little difficulty in so doing, but with confidence on the part of the operator and frequent repetitions there may come a momentary inability to open the eyes, followed by an absolute inability to do so. The method of Braid, consisting in having the subject gaze at a bright object held about twelve inches in front of the eyes, requires more patience, and frequently the ocular strain is so great as to bring on a conjunctivitis. The subject once brought to this stage, it is possible in later trials to change the passive state into a condition of active somnambulism.

Gastric Hyperacidity and Gastric Symptoms.—

STEELE, J. D. *Journal of the American Medical Association,* vol. xlvii, No. 7, Aug. 18, 1906.

The writer, with a view to confirming Stockton's theory that the symptoms credited to gastric hyperacidity are due mainly to a hyperesthesia of the gastric mucosa, and to ascertain what other factor might also be effective, has studied thirty cases under his observation. In about one-half of his cases the cause of the irritation and pain lay in the existence of decided gastric motor insufficiency or of hypersecretion. In fourteen, however, no cause could be demonstrated for the hyperesthesia, but in nearly all of these the gastric symptoms were directly connected with overfatigue or worry, or were a part of a general nervous irritability. All the patients were benefited and ultimately cured by treatment directed to the nervous condition. This, with the fact that the symptoms do not appear to depend necessarily on the amount of acidity and may be absent when it exists to a very high degree, seems to indicate that in these cases it was the local manifestation of a general state of nervous irritability. This was the view taken by Kaufmann, Stockton, and Musser, each of whom have reported similar cases. The practical bearings of this on the treatment are obvious, as that for the neurosis must differ from that of cases due to ulcer, retention, or hypersecretion. Steele finds a liberal mixed diet non-irritating to the sensitive mucosa, and the use of nerve sedatives, together with agents to relieve acidity, most useful. His experience also agrees with that of Musser as to the value of nux vomica, in doses slowly ascending to the physiologic limit, in the treatment of these cases.

Nasal Disease and Neuralgia.—

SOMERS, L. S. *Journal of the American Medical Association,* vol. xlvii, No. 10, p. 741, Sept. 8, 1906.

The writer describes and gives illustrative cases of various types of facial neuralgia occurring from disease of the nose and its accessory sinuses. Nasal neuralgia, *per se,* does not necessarily follow from disease of the nose itself; the pain there located may be due to changes in other regions, as the Gasserian ganglion, etc., although the nose itself may be diseased, as a consequence rather than as a cause. Of all the disorders of the nasal chambers, exclusive of sinusitis, hypertrophy of the turbinates, especially the middle one, is the most frequent cause of neuralgia. Pressure of the turbinate against the septum may cause both facial and supraorbital neuralgia, the latter from irritation of the nasal branches of the fifth nerve, and aggravated if there is also sinus involvement. Acute rhinitis with excessive congestion and intranasal swelling, especially if sinusitis coexists, may cause neuralgia, and in the later stages, when there is purulent discharge with obstruction, transient neuralgic pains are not infrequent. While slight irrita-

tion of the nose may cause enough nervous instability to give rise to neuralgia, in the majority of cases, as shown by one reported by Lermoyez, actual nerve changes are present. Neuralgia from maxillary sinus disease is probably less frequent than that from frontal sinusitis, though the nerves are more exposed. The pressure from retained morbid secretion, owing to the anatomic conditions, is rather less common than in frontal sinus disease, but any severe facial pain should direct attention to the maxillary sinus. Acute inflammation of the frontal sinus is always accompanied with headache and often with severe neuralgia. In all forms of frontal sinusitis, from whatever cause, supraorbital neuralgia of the affected side is not infrequent. Rarely the pain is occipital, and then the diagnosis is liable to be confused. Empyema of the ethmoid cells is more likely to cause headache, but may give rise to occipital and frontal neuralgia, and the latter may be due also to sphenoidal sinusitis, though here also headache is most common. Lastly, he mentions neuralgia associated with combined or multiple sinusitis and intranasal disease, which is the most bizarre and confusing of all. One cannot be sure in these cases of its relation to any particular changes in the nose or sinuses until all the affected parts have been approximately restored to their normal conditions. Illustrative cases of neuralgia from the various forms of nasal disease are reported.

Acroparesthesia.—

LESEM, W. W. *Medical Record,* vol. lxx, No. 9, p. 337, Sept. 1, 1906.

The writer defines acroparesthesia as an affection of the peripheral nerves, characterized by burning, pricking, pins-and-needles, numb, crawling, itching, or breaking sensations, distributed usually over the extremities. Not infrequently, however, the head, face, chest, back, and abdomen are involved. The viscera are rarely affected. Among two hundred cases seen by the writer in the past few years, 94½ per cent occurred in women. The majority of the patients are between the ages of 30 and 40 years. Circulatory and gastrointestinal disturbances appear to be the cause of the large majority of the writer's cases. Menstrual and puerperal disorders occurred in 12 per cent. Occupations such as tailoring and constant immersion of the hands in water occurred as an etiological factor in one per cent. The symptoms vary with the intensity of the disease. The course of the disease is either short, or it becomes chronic and progressively worse. The types most susceptible to treatment are those dependent upon puerperal and climacteric disorders and upon autointoxication.

Functional Derangement of the Ears and Upper Air Tract in the Insane.—

BRYANT, W. S. *Medical Record,* vol. lxx, No. 8, p 281, Aug. 25, 1906.

These researches were undertaken to show the relation, if any, between insanity and functional derangement of the ear and upper air tract. Only three cases out of one hundred and sixty-one had perfectly normal hearing. These patients were examined at the Manhattan Hospital. Although, as the author states, the number of cases is not large enough to prove any point conclusively, they suggest that nasopharyngeal or aural diseases are far more prevalent among the insane than among normal individuals; that sometimes hallucinations of hearing appear to be excited by subjective sensations of hearing; and that aprosectic psychosis is sometimes aggravated, if not excited, by intranasal pressure. The prognosis for psychical improvement from treatment of the nasopharynx when nasal complications are a disturbing factor, and of the ear

when active aural disease is a disturbing factor, is good. The prognosis is bad when chronic inactive aural conditions are a disturbing factor.

Dipsomania.—

DOUGLAS, C. T. *Medical Record,* vol. lxx, No. 12, p. 454, September 22, 1906.

The writer defines dipsomania as an abnormal demand of the nervous system, either constant or periodic, for the drug action of alcohol —a demand so strong that the patient takes the alcohol in spite of his earnest wish and effort to avoid it. Dipsomania partakes of the nature of both a neurosis and a psychosis, the predisposing cause being a nervous system that is peculiarly susceptible to the poisonous or intoxicating action of alcohol. Dipsomania is a curable disease and not a mere habit. The patient should be removed from home, with all of its customary surroundings, and devote himself to the business of being cured. In the majority of cases the writer administers some remedies hypodermically at stated hours. He usually prescribes alcoholic liquors during the first few days of treatment, gradually withdrawing them. Milk and raw eggs are probably the best nutriment. Apomorphine is the most prompt and effective hypnotic.

An Unusual Case of Tic.—

GORDON, A. *American Medicine,* vol. xii, No. 6, p. 342, September, 1906.

While the phenomena of tic are closely associated with the muscular apparatus they have been shown to have a psychical basis, as is illustrated by the case of a young man who came under the writer's observation. He was affected with abrupt movements, spasmodically repeated, accompanied by a bending forward of the upper half of the body. The muscular contractions by which this was accomplished were limited to the abdominal recti. No other muscles were involved. When the patient was carrying on a rapid conversation the movements would cease or disappear entirely. The same result was obtained when deep pressure was exercised over the groins or lower part of the spine. As soon as the conversation ceased the movements recurred. The tic had lasted about one year, the patient presenting a number of other hysterical stigmata.

SURGERY.

The Radical Cure of Aneurism.—

MATAS, R. *Journal of the American Medical Association,* vol. xlvii, No. 13, September 29, 1906.

The writer gives the history of his operation of intrasaccular suture, and remarks that in spite of his efforts to elucidate the general principles and method of the operation a good deal of misapprehension still seems to exist. He here describes the operation as consisting of two fundamental procedures: 1, The obliteration by suture of the vascular orifices which open into the aneurismal sac; 2, the obliteration of the sac by suture, which brings its inner surfaces in apposition, or by other methods which leave the sac undisturbed and tend to secure primary healing. In obliterating the vascular orifices that supply the sac, the parent trunk which nourishes the aneurism may be preserved or obliterated at the point of attachment, according to the type of sac encountered. Hence the subdivision into two varieties: "1. Obliterative endoaneurismorrhaphy (the fundamental procedure) essentially consists in opening the sac freely without disturbing it from its surroundings and closing all visible arterial orifices within the sac by suture, thus securing complete hemostasis and permanently stopping all further access of blood into the aneurismal cavity. The sac is obliterated by approximating its walls with buried sutures and closing

the wound, with or without drainage; or, in rigid cavities, by simply infolding the overlying skin flaps and lining the cavity with them (*capitonnage* of the French), or by one of the several procedures or variations I have suggested." This method is indicated in all aneurisms in which the sac is of a fusiform type in which there are two or more orifices of supply, and in which the parent artery is entirely lost at the seat of the aneurism by blending with the aneurismal sac throughout its circumference. In these cases no attempt is made to restore the continuity of the parent artery. The blood stream is interrupted in that part of the vessel directly opening into the sac, to which all sources of blood supply are cut off by suture. Twenty-two of the American cases reported are of this operation. "2. Restorative endoaneurismorrhaphy. This variation in the procedure is solely applicable to aneurisms of the sacciform type, in which the parent trunk retains its continuity and normal outline, and the aneurism is a sac simply grafted on the vessel. By opening the sac freely and washing out the clot, the opening leading to the artery is exposed inside the aneurism and is readily closed by a continued suture which penetrates through all the coats of the sac at the margin of the orifice of communication. By this procedure the blood supply of the sac is permanently arrested, the lumen of the parent artery remains patulous, and the arterial stream supplying the limb or dependent territory is immediately restored through its normal channel. The sac is then obliterated by bringing its endothelial surface together with buried sutures, and the surface wound is closed in the usual manner. Up to the present time seven operations of this type have been reported by American surgeons, all successful, and two at least of the foreign cases may be appropriately added to this list, making nine in all. 3. Reconstructive endoaneurismorrhaphy (arterioplasty) is applicable solely to fusiform aneurisms in which the coats of the sac are firm and resistant and the two openings leading to the main artery lie on the same level, in close proximity, and are situated at the bottom of a superficial or readily accessible sac. In aneurisms of this type, especially those of traumatic origin, the continuity of the parent artery may be restored by making a new channel out of the sac walls, which can be brought together by suture over a guide (catheter or drainage tube) inserted into the proximal and distal openings of the aneurism. Before tying the last sutures the guide is removed and the channel is left behind, corresponding to the outline of the original artery. The sac is then obliterated by approximating its surfaces with buried catgut suture, as previously applied in the first and second procedures." Thus far five cases of this operation have been reported, all by American surgeons. Two of these patients have relapsed, and in one of these cases he thinks that the amputation which followed might have been saved had a secondary obliterative operation been performed. A summary of the heretofore recorded and well-attested cases of these operations is given.

R. Lozano (*American Medicine,* Sept., 1906) gives his conclusions regarding the Matas operation.

1. The method of intra-aneurismal suture or endoaneurismorrhaphy (Matas) will cure aneurisms as radically as the method of extirpation.

2. The method of suture is exempt from the majority of postoperative complications which usually follow the methods classically recommended for the cure of aneurism and for the control of hemorrhage.

3. The method of suture can be applied to all aneurisms that are surgically accessible in

any part of the body, whereas the method of extirpation is not practicable with safety in all regions.

4. The method of intrasaccular suture is the most favorable for the preservation and development of the collateral circulation, as this is not disturbed in any way by suturing the orifices of the vessels inside of the sac.

5. The method of intra-aneurismal suture in aneurisms of the subclavian is of comparatively easy and safe execution, whereas the extirpation of the sac is difficult and dangerous.

6. The suture of the orifices in subclavian aneurism should be preceded always by a prophylactic ligature applied close to the sac on the cardiac side.

7. The method of suture in popliteal aneurisms is simple and easy and only requires for prophylactic hemostasis the application of a circular constrictor on the cardiac side. Great care must be taken, however, not to disturb the perianeurismal structures, and especially the vein, which should always be respected.

8. The method of intra-aneurismal suture is the only operative procedure which offers any prospects of radical cure in the treatment of abdominal aortic aneurisms.

9. The extirpation of abdominal aortic aneurisms is impractical; all of the other methods, including the ligature, are unreliable, unsafe, and not radical.

10. The technique of the endoaneurismorrhaphy as applied to abdominal aortic aneurisms must be modified and improved by securing prophylactic hemostasis without forceps, or other methods which would endanger the integrity and vitality of the aortic tunics, especially in dealing with degenerate and calcareous vessels. To obtain the ischemia of the field of operation without disturbing the aorta from its bed or interfering with its nutrition, he would suggest the use of a compressor, shaped like a crutch, provided with a curved crosspiece at the end of a long aseptible metallic handle. If the crosspiece is made semilunar in shape and is covered with soft rubber, it will ride astride the aorta and compress this vessel against the vertebral column, over its peritoneal covering, without exercising injurious pressure when controlled, by the hand of an assistant, outside of the abdominal cavity. The hemostasis obtained by this simple contrivance has the advantage that it will permit the flow of blood to be reëstablished whenever the operator may desire to test the line of suture in the aneurism, and thus enable him to reënforce any leaking or weak points before closing the sac. It is also advisable in future to make a careful preliminary examination of the aorta in the vicinity of the aneurism to determine the condition of its tunics. When marked rigidity from calcareous degeneration exists it will be the part of wisdom to close the cavity without attempting further operative procedures.

11. Prophylactic hemostasis with forceps, if effective, is likely to injure the diseased walls of the vessel and to precipitate a fatal termination by hemorrhage.

12. A provisional ligature for hemostatic purposes is open to the same objection, and if allowed to remain permanently will defeat the purpose of the arteriorrhaphy, as it will surely favor secondary hemorrhage and put out of function a number of collaterals which would be saved by the simple intrasaccular suture. One of the advantages of intra-aneurismal suture over the ligature is that it offers a stronger, more resisting barrier to the blood stream above the line of obliteration, and is thus much less liable to secondary hemorrhage than the ligature, which has invariably failed in every case of abdominal aneurism operated by ligation up to the present time.

Status of Brain Surgery.—

STARR, M. A. *Journal of the American Medical Association*, vol. xlvii, No. 12, p. 926, Sept. 22, 1906.

The writer considers that sufficient time has elapsed to enable us to estimate the value of brain surgery for the relief of tumors, epilepsy, and abscess with considerable accuracy. It is only in localized Jacksonian epilepsy (about 2 per cent of all cases) that operation is indicated, and in only about 20 per cent of these is it successful. Trephining for epilepsy, therefore, is of very limited application and is only to be recommended in a few selected cases which present the necessary guide to both physician and surgeon. In abscess of the brain, early operation as soon as the condition is diagnosed is imperative, and in cases of skull fracture or concussion, followed within two or three weeks by symptoms suggestive of abscess, even if there are no localizing symptoms, trephining is imperative. There are many regions of the brain, injuries of which are associated with no localizing signs. In abscess due to chronic otitis, operation is demanded as soon as the diagnosis is made. While statistics show the percentage of recoveries after operation for cerebral abscess at present is only about 60 per cent, there is every reason to believe that it will be much greater when early diagnosis and immediate operation is the rule. In brain tumor with positive localizing symptoms, operative interference may be warranted, but in the far greater number, without localizing symptoms, operation promises nothing. Post-mortem statistics indicate that about 10 per cent of brain tumors are open to surgical treatment, and that the best results may be expected when the growth is located near the Rolandic or Sylvian fissures, and the highest mortality when it is in the cerebellum. The proposition to afford relief in inaccessible tumors by making a considerable opening in the skull to relieve pressure may be of value in some cases. Starr mentions one of his own observation in which this procedure was of benefit, and two others in which it failed. In cases of extradural hemorrhage from traumatism, with symptoms of intracranial pressure, slow pulse, steady rise in blood pressure, deepening coma, Cheyne-Stokes respiration, and increasing hemiplegia, all appearing within six hours of the injury, trephining is sufficiently clearly indicated. The hemorrhage is usually from the middle meningeal artery, hence a large trephine opening or a large, bony flap should be made in the area just above the ear. In apoplexy Cushing has applied successfully, in hospital cases, the test of the condition of the blood tension in determining the need of surgical intervention to save life. When the blood pressure rises steadily to 250 mm., measured by the Riva-Rocci or the Janeway apparatus, in a case of apoplexy, and when coincidentally with this there is a slow pulse falling to 50 a minute, it may be said that the case will be fatal unless pressure is relieved by a considerable opening in the skull, without regard to the finding or removal of the clot. The best place for this is over the motor area of the side opposite the paralysis, as the clot may be there. Cushing's cases show that this operation may sometimes save life in an otherwise hopeless condition. Cushing has also treated surgically with success new-born infants who after a difficult labor have suffered an extradural or intradural hemorrhage. Such infants usually die, or if they survive are defective, hemiplegic, idiotic, etc., and any measure for their relief is justifiable. It is easy in these cases to relieve intracranial pressure by opening the sutures of the parietal bone with scissors, and his success warrants urging obstetricians to consider this operation in the case of asphyxiated infants of the class described above. Obstetricians see these cases, and if they are convinced that delays are dangerous

the percentage, Starr says, of idiocy and hemiplegic epilepsy will certainly be reduced. The last class of cases of cerebral hemorrhage suitable for trephining is that in which hemiplegia or hemianopsia develops slowly after an injury and does not come to its height for three or four days. In these there is probably a surface hemorrhage from a vein in the pia mater, and lumbar puncture will probably reveal blood in the cerebrospinal fluid. The symptoms may progress and threaten life, or come to a standstill, leaving the patient permanently incapacitated. In either case surgery is indicated. Starr refers here to a case of this kind in which a clot was removed from the lower third of the Rolandic fissure with good results, and remarks that many other similar cases, equally successful, could be cited. In conclusion he refers to the methods that have been recommended and employed to cure microcephalic idiocy by relieving pressure on the brain and permitting its expansion. Experience has shown the uselessness of such surgery, and it is no longer recommended.

The Operative Treatment of Varicose Veins.—

Bulletin of the Johns Hopkins Hospital, vol. xvii, No. 186, p. 289, September, 1906.

The writer concludes a critical summary of the subject of varicose veins and the various operations for their relief with the following views:

1. Varicose veins of the leg are not an incident of senility; the condition is rather a disease of young and middle-aged individuals, over one-third of the cases appearing before the 30th year and two-thirds before the 40th year.

2. From an etiological standpoint there are two classes, viz., inflammatory and non-inflammatory. The inflammatory group includes about one-third of all cases, phlebitis occurring as a complication or sequel of pregnancy, postoperative convalescence, or an acute infection, among which typhoid fever is the most frequent. The pathology of the non-inflammatory group is obscure.

3. In 128 cases the right and left legs are affected in about equal proportion; over one-half of the cases are bilateral.

4. Trendelenburg's operation cured 78 per cent in a series of 41 cases; this is about the result generally reported. In the first four postoperative years 89 per cent were cured, in the 5th to 8th postoperative years but 63 per cent were cured; the tendency to recurrence of symptoms increases as the postoperative interval lengthens.

5. Schede's operation cured 33 per cent in a series of nine cases. Of two cases, 2 years or less since operation, both were cured; of seven cases, more than 2 years since operation, but one was cured. The tendency to recurrence of symptoms as the postoperative interval lengthens is much greater after a Schede than after a Trendelenburg operation.

6. Division between ligatures of the saphenous vein does not insure permanent occlusion. The venous stream may be reëstablished in three ways, viz., dilatation of anastomoses around the point of division (two cases), formation of varices in the scar (three cases), or end-to-end anastomosis of the ligated stumps (three cases). The Schede operation is followed particularly by anastomosis of ligated stumps; of six cases examined three showed an intact saphenous vein running directly through the scar.

7. Functional restoration of the saphenous vein may be, but is not always, accompanied by recurrence of symptoms.

8. Resection of 8 centimeters or more of the saphenous vein at the saphenous opening made through a generous transverse skin incision is to be preferred to simple division of the vein.

9. Postoperative pulmonary embolism is

rare, but has occurred between the fourth and thirteenth days. The onset is marked by sudden dyspnea, cyanosis, tachycardia, and signs of collapse accompanied by rise in temperature; the symptoms may subside rapidly, may persist with the physical signs of pulmonary infarct, or may be followed immediately by sudden exitus.

Stiff and Painful Shoulders.—

CODMAN, E. A. *Ohio State Medical Journal,* vol. ii, No. 2, p. 55, Aug. 15, 1906.

The characteristic symptom of this complaint is an inability to carry the arm back of the neck or behind the small of the back. They are frequently classed as rheumatism, fibrous ankylosis, paralysis of the deltoid, and periarthritis. He believes that these cases are due to an inflammation of the subdeltoid bursa. This structure is sometimes spoken of by anatomists as the subachromial bursa, but it is the subdeltoid portion which is most exposed to injury. This bursa is indispensable in abduction and rotation of the humerus. The pathological conditions associated with inflammation of this bursa are various. In some there is rupture of muscles or thickening and inflammation of the lining membrane of the bursa, but in most of them there were adhesions which quite effectually limited rotation of the arm. The symptoms vary from mere discomfort in raising the arm to a marked limitation in the motion of the shoulder-joint.

The writer describes four types. In the first, which are acute or recent cases, there may be a limitation in both abduction and rotation to that which is obtained by movement in the shoulder-joints alone, which amounts to about ten degrees. Beyond this the bursa is pressed upon and acute pain is caused. The fact that the bursa alone is involved can sometimes be determined by the tenderness. In others this symptom is difficult to elicit because of the deep situation of the inflamed structures. The tenderness is almost always under the greater tuberosity and external to the bicipital groove. Pain is a quite constant symptom and especially annoying at night. Almost invariably the pain extends down the arm in the region of the external or internal cutaneous nerve, passing to the outer or inner side of the biceps muscle. Sometimes the patient thinks that the seat of the trouble is at the insertion of the deltoid muscle.

Type two is where the more acute symptoms pass to the stage of adhesion with atrophy of the shoulder muscles. There is usually some complaint of pain. In some cases the nervous element is so strong that the case passes for neuritis, and much has been written about reflex joint atrophy. In some cases the secondary changes in the nerves and muscles almost amount to a real paralysis and simulate lesions of the brachial plexus.

In type three the essential characteristics are pain in certain motions, but the ability to carry out the arc of full motion of the joint persists; pain is almost always felt at that point of abduction where the tip of the tuberosity passes under the acromium. Sometimes it is called forth by rotary or pushing motions. Sometimes the patient is unable to produce it at will, and for days he may be annoyed by it, and then it will appear to improve. In one case of this type operated on by the writer extensive adhesions were found.

A fourth type is that in which there is a rupture of the supraspinatus tendon, or the facet of bone to which it is attached is torn off. These cases are distinguished from involvement of the shoulder-joint by the fact that there is always a few degrees of painless abduction, extension, and internal rotation, even when the scapula is firmly fixed. When the

joint proper is involved the spasmodic fixation is nearly absolute. Palpation of the joint from the axilla is also painless in subdeltoid bursitis, while in disease of the true joint there are signs of tenderness. Most minor lesions of the shoulder-joint involve the bursa, and a few involve the true joint. On the other hand, severe diseases such as tuberculosis or sepsis usually involve both structures. In the treatment of this condition the acute cases should have rest, and a splint has been devised for holding the arm at right angles to the body in internal rotation and abduction. A practical substitute is to seat the patient with his side at a table and let the arm rest on a pillow. As soon as the pain will allow gentle passive motion should be begun to prevent adhesions. The patient must not be allowed to have the arm in a sling position. Reduction under ether is disappointing in the chronic cases, as it converts these into the acute type, and after the inflammation has subsided the trouble is as bad as ever.

Morphia in Cases of Abdominal Section.—

HAWKES, C. S. *Australasian Medical Gazette,* vol. xxv, No. 8, p. 392, August 20, 1906.

The writer's studies are based on the postoperative results in 200 cases of abdominal section in which morphia was given in one-sixth grain doses. In each of these cases gas and ether were used in sequence and the anesthetic administered through a Clover inhaler. It is important to give only one-sixth grain of morphia sulphate; the one-fourth grain so commonly prescribed is too large, and it is due to this overdose that the postoperative effects of morphia are bad. By giving morphia in small, and if necessary repeated, doses few ill effects are noted, while equally good results are obtained. From the anesthetist's standpoint the administration of morphia prior to the operation has several advantages. The patient comes more easily under the influence of the anesthetic, while recovery is more comfortable and is attended with less disagreeable consequences. Morphia lessens shock by dulling the pain perception. The writer's final conclusions are that morphia puts the patient in a better condition for undergoing operation, being less nervous and with a nervous system less liable to be affected injuriously by nerve impulses tending to cause shock. The anesthesia is quieter and less anesthetic is required. There is less distress and pain after operation and with lessened pain there is a quicker convalescence. Shock after morphia is less frequent and less marked when it does occur. Vomiting is less severe and does not persist so long, and constipation does not occur with the small doses of morphia recommended.

Surgical Treatment of Trigeminal Neuralgia.—

MOSCHCOWITZ, A. V. *Medical Record,* vol. lxx, No. 13, p. 486, September 29, 1906.

The writer sums up his paper as follows: 1. Eliminate any possible etiological factors, such as tumors, carious teeth, antral disease, malaria, syphilis, etc. 2. Determine accurately the nerve branch or branches involved. 3. The operation should be performed as near to the periphery as possible. 4. The operation should be performed early. This is important, because the earlier the case the more chances there are that a peripheral operation will be of benefit. 5. Whatever the character of the operation may be, the dominant principle must be the prevention of regeneration of the affected nerve. More specifically the operations may be classified as peripheral and central. If the supraorbital, infraorbital, mental, malar, or inferior dental branches, either singly or collectively, are involved, the nerve should be divided and the foramen plugged by a gold or silver wire or button. If the superior or inferior maxillary is involved, Abbe's operation is indicated.

A celluloid or gold button should be substituted for the rubber tissue. The writer believes that by following these suggestions the extirpation of the Gasserian ganglion will be rendered unnecessary.

Results of the Bloodless Reduction of Congenital Hip Dislocation.—

STERN, W. G. *Medical Record,* vol. lxx, No. 11, p. 414, September 15, 1906.

The writer reports statistics, gathered from operators scattered all over the world, which very nearly agree with those first given out by Lorenz as his own experience. The number of hips reported as successfully operated upon since 1900 is 2593. Ideal results, restitutiones completæ, 48.98 per cent; anatomical restitutions, 41.76 per cent, 1084; excellent functional results, 7.22 per cent, 187. Good function from transpositions, 39.98 per cent, 1036. Failure, redislocation, bad function, 12.10 per cent, 314. The discrepancy between failures and good results (about 1 per cent) is due to inaccuracy of many of the reports. Individual operators have had far better results. These latter results will and must be attained through careful and painstaking work, combined with increasing experience and advanced methods.

Shock.—

WAITE, L. *Medical Record,* vol. lxx, No. 10, p. 367, September 8, 1906.

The writer states that the phenomena of shock manifest themselves through the nervous, circulatory, and respiratory systems, and principally in those organs best supplied by the sympathetic system. The intensity of physical shock is influenced by the extent of the injury, the nearness of the traumatism to the solar plexus, the character of the injury, and the severity of the pain produced. The diagnosis of shock is the recognition of the clinical phenomena. Practically the only difficulty lies in differentiating this condition from syncope caused by severe hemorrhage. The physician should never be content with a diagnosis of shock until every possibility of hemorrhage has been excluded. In the prognosis temperature is the best guide. If subnormal, 96° or below, for several hours, the prognosis is almost invariably unfavorable.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Amblyopia in Young Children Consequent upon Inherited Syphilis.—

STEPHENSON, S. *Lancet,* vol. clxxi, No. 6 of vol. ii, p. 357, Aug. 11, 1906.

Attention is called to the difficulty of ophthalmoscopic examination in young children and to the difficulties in estimating the degree of vision. The writer would add a fifth group to the four usual forms of amblyopia recognized in children which is attributable to syphilis. The condition is due to opacities in the vitreous humor, and remotely to a specific inflammation of the choroid or the retina, or of both of these structures. The condition is not an uncommon cause of defective eyesight in children, and it should be recognized early that specific treatment may be employed while there is a chance of curing the disorder. The writer's six cases are as follows:

Case 1.—Amblyopia in an infant, aged seven months, who died twelve days after she was first seen, presumably from congenital syphilis. A. B. came under treatment at the Evelina Hospital on July 19, 1901, on account of defective sight. The mother did not know whether the baby had ever seen well, but she was certain that during the last month sight had become worse. A. was the third child, and it was significant that the second child,

now aged 18 months, had suffered in much the same way, and was now recovering her sight. Upon examination A. B. was found to "snuffle," to be wasted, and to present a condyloma in the right groin. Her eye rolled about aimlessly, and she took not the least notice of a bright object, as a gold watch. The pupils (as in most infants) responded imperfectly to atropine, and no view of the details of the fundus could be obtained with the ophthalmoscope. A week later, however, opacities, especially in the anterior part of the vitreous humor, and the optic disks could be dimly recognized. The baby died on July 31, 1901.

Case 2.—Amblyopia in a syphilitic infant, aged 11 months; considerable improvement under specific treatment. C. D. was admitted on March 7, 1902, with the history that he had never seen well. Although born at term, yet he was a small baby. He "snuffled" for several months and did not thrive. He was bottle-fed. The mother had been married thirteen years; she had had no miscarriages. On examination there was found a tolerably well-nourished baby, the bridge of whose nose was markedly sunken ("saddle-bridge"). He followed the flash of the ophthalmoscopic mirror quickly and correctly. The pupils were equal but not responsive to light. The eyes (examined under chloroform) contained vitreous opacities, so numerous as to obscure all deeper details. Under treatment with mercury and chalk, one grain twice a day, the baby showed much improvement. On April 25 he was stated by his mother "to notice everything." His pupils were then responsive to light and the vitreous opacities were less marked. He had put on flesh and become good-tempered.

Case 3.—Amblyopia in a wasted infant, aged three months, associated with ptosis and spasmodic contraction of the muscles of one eye. E. F., a wasted, "snuffling" baby, was taken to hospital on January 26, 1904, because she was said "to take no notice of anything." She was the sixth member of the family, three members of which had died from "wasting." There was spasmodic ptosis of the left upper lid, with occasional deviation of the left eye downward and outward. The eyes were most difficult to examine, but the right optic disk—the only one of which a good view could be obtained—was grayish-white, and opacities were present in the vitreous humor of each eye.

Case 4.—Amblyopia of fluctuating type in an infant, aged two months, who had suffered from ophthalmia neonatorum; considerable improvement under mercurial treatment. G. H. was taken to hospital on January 9, 1906, with the statement that both eyes had become inflamed on the second day after birth, and that since then the baby had taken little notice of things about him. On examination there was discharge from the conjunctiva, the condition of which was tolerably good. A small central macula was present on the left cornea. The pupils reacted but slightly to light. The results of the mirror test were inconclusive, the baby now taking notice of the ophthalmoscopic flash and again remaining impervious to the light stimulus. No details of the fundus could be recognized, owing to fine vitreous opacities, lying chiefly in the anterior part of the humor. The baby was treated with mercury and chalk (one grain three times a day) from January 29 to March 24, and a note made upon the latter date states that the mirror flash was well followed by the baby. The evidence of congenital syphilis in this case was not so conclusive as one could have wished, but the child "snuffled" and was wasted. It would be unsafe to lay any great stress upon the craniotabes that was present, since there is still a difference of opinion among competent authorities as to the precise significance of that sign.

Case 5.—Dull and fluctuating sight, due to

vitreous opacities and choroiditis, in a child aged two years, who had suffered from symptoms of congenital syphilis; improvement under prolonged treatment by mercury. I. K. was taken to hospital on August 22, 1905, on account of her sight, which was stated always to have been defective. It had been noticed that her sight was worse in the morning than at other times. The eyes had never been inflamed. She was the fifth child in the family, and there had been no still-births or miscarriages. When the baby was about three months old she wasted, began to look old, had an eruption on her skin, and presented bleeding ulcerations upon her lips and buttocks. She recovered after about three months' treatment by a medical man. Upon examination the child was found to walk and to talk. Her head was rather small. Her eyes were steady, and her pupils were equal and responsive to light. She saw and followed with her eyes the flash of the ophthalmoscopic mirror in the darkened room. The right eye, as tested by the position of corneal reflex, had a slight convergent squint. There were fine vitreous opacities in each eye, concealing to some extent the ophthalmoscopic view of the fundus. But on careful examination with concentrated light faint but extensive choroidal changes could be recognized. Pigmentation, as usual in young children, was not a marked feature of the choroiditis. Under six months' treatment by mercury with chalk (from two to five grains per diem) the vitreous opacities disappeared and the sight became much sharper. The choroiditic changes, moreover, were seemingly brought to a standstill.

Case 6.—Amblyopia in a young child whose father admitted syphilis; nervous symptoms and loss of sight, the latter due to vitreous opacities, disseminated areolar choroiditis, and choroiditic atrophy of the optic disk; partial recovery under mercurial treatment. L. M., aged two and a half years, was taken to the Evelina Hospital on November 14, 1905, with the following history: The child had no definite illness until seven weeks previously, when he complained of pains in the chest, went "off his feed," began to waste, and eventually lost consciousness for a couple of days. Upon recovery it was found he had lost the use of his left hand and leg, and about a week later he had lost his sight, which had previously been good. The father, who had been married thirteen or fourteen years, had suffered from syphilis seven or eight years prior to marriage. The first child, a boy, had died at six years from diphtheria; next came a miscarriage; and, lastly, the patient was born. Upon examination the child took no notice of a light and the left eye tended to diverge. The vitreous was cloudy, the optic disks were badly defined, and there were numerous patches of choroiditis in each fundus. Mercury with chalk (from three to five grains per diem) had acted so well that on April 10, 1906—that is, after about seven months' treatment—the child noticed the mirror flash, although not always readily. The fundi showed slightly pigmented areas of choroiditis; the disks were "on the pale side;" but no vitreous opacities could be recognized.

The condition described is an early manifestation of hereditary syphilis, and it is comparable to the retinochoroiditis observed in acquired syphilis usually from six months to two years after the initial lesion. In both conditions the involvement of the vitreous may obscure the choroiditic and retinitic lesions. In babies a cloudy vitreous is almost certainly due to congenital syphilis. The diagnosis of these opacities may be easy or difficult, but fluctuation in vision is suggestive of their existence. It is seldom that "floaters" are seen with the ophthalmoscope, the condition being usually that of dust-like opacities, the effect

of which is to veil or actually conceal the details of the fundus. In some cases the hazy vitreous clears quickly under the influence of mercury. None of the writer's cases showed signs of iritis.

Two Cases of Acute Poisoning: (1) By Phosphorus; (2) By Cocaine.—

COURTNEY, B. J. *British Journal of Children's Diseases,* vol. iii, No. 8, p. 345, August, 1906.

The first case, that of phosphorus poisoning, occurred in a girl of 12 years who had complained of pain in the stomach and had vomited two or three times. She had been questioned by her mother and stated that she had been sucking matches. The number or why she had sucked them was not elucidated. The matches were of the ordinary red variety, ignited by friction. There was nothing in the symptoms to suggest a serious condition, though the mother was somewhat alarmed by the story of the matches and brought the child to the hospital. For the next five days the child was able to be up and about, though she complained of some pain in the region of the stomach, and there was a tendency to drowsiness. When seen on the sixth day the pulse was under 120, small and soft. There was distinct jaundice and frequent convulsions. The only complaints made by the patient were of slight cramps in the legs. From this state the patient rapidly passed into a coma, and died a few hours later. At the post-mortem examination there was found erosion of the mucous membrane of the stomach and duodenum, but no ulcers. The liver was slightly enlarged, yellow in color, and greasy to the touch. The liver and kidneys showed advanced fatty degeneration on microscopical examination. The practical conclusion drawn from the facts in this case is that no history of match sucking or other means of taking phosphorus, however slight, ought to be discounted, whether there are any symptoms to support the story or not. In phosphorus poisoning there may be no or only slight symptoms for several days after the poison has been taken. Once the poison has been absorbed in sufficient quantity to interfere with oxygenation of the tissues no treatment is of avail.

The case of cocaine poisoning occurred in a boy aged two, who had been previously perfectly well, but was suffering from an attack of catarrhal laryngitis. The fauces and pharynx were painted with a five-per-cent solution of cocaine twice, about an hour apart. Within an hour after the second application there were acute nervous symptoms, incessant and incoherent talking bordering on delirium, with marked insomnia. The pupils were dilated, and there was slight anesthesia of the skin. The symptoms persisted acutely for six or seven hours, and finally yielded to five-grain doses of bromide of potassium with two grains of chloral hydrate given every two hours. No ill effects were subsequently observed. It is probable that the dose of cocaine was very small, and points to an unusual susceptibility on the part of this patient.

Percussion of the Skull in Cerebrospinal Meningitis of the Epidemic Type.—

KOPLIK, H. *Medical Record,* vol. lxx, No. 13, p. 481, September 29, 1906.

The writer does not discuss lumbar puncture as a method of diagnosis, but the value of head percussion in determining its use as a therapeutic measure. Lumbar puncture is employed in meningitis to remove fluid and thus lessen pressure, which may save life. Unquestionably lumbar puncture is useful in cases of high intracranial pressure due to meningitis, but the difficulty is to decide when it should be employed. Acute hydrocephalus according to McEwen can be detected by the alteration in the cranial percussion note, which varies according to the position of the head. With the head upright a resonant note is obtained by percus-

sion of the skull at the level of the frontal bone and the squamous portion of the parietal. This note becomes tympanitic when the head is inclined to one side. McEwen found this note in over 40 children and young adolescents who had distended ventricles due to various causes. In the standard works on medicine there is no reference to percussion of the skull in cases of cerebrospinal meningitis. It is the only definite means of determining that there is an increase of fluid in the ventricles or the subarachnoid space. The other symptoms, such as delirium, headache, and hyperesthesia, may often be associated with a limited accumulation of cerebrospinal fluid. The idea of drainage in the meningococcus form of meningitis is not scientific as this type of meningitis tends toward recovery if life can be prolonged; in other words, it is a self-limited affection. In such cases lumbar puncture is only indicated when intracranial pressure suddenly runs up, when it should be performed promptly and sufficient fluid evacuated to lessen the intracranial pressure so that the vital functions can be carried on. The writer describes a case in which a child had been ill for twenty-four hours, when it suddenly fell back, collapsed and unconscious. A lumbar puncture was made which withdrew 50 Cc. of cerebrospinal fluid under great pressure, followed by a prompt improvement in the symptoms and the ultimate recovery of the child. In this case the physical signs of distended ventricles were present on percussion of the skull.

Hyperlactation.—

DINGWALL-FORDYCE, A. *British Journal of Children's Diseases,* vol. iii, No. 7, p. 302, July, 1906.

Any definition of hyperlactation must be purely arbitrary, as its normal duration is variable, dependent on several factors. By hyperlactation is meant maternal nursing which is wholly or partially indulged in for a longer period than one year. This limit may be successfully overstepped, and it may be right for a healthy mother to nurse a feeble infant beyond this period. The proportion of cases in which it is justifiable is very small, and the practice is accompanied by dangers to both the mother and child. In a majority of cases the practice is only a vicious one, and is very infrequent among the better classes, but among the poorer it is very common. In the case of 645 children 35 per cent were bottle-fed or breast-fed for less than six months, 43 per cent were breast-fed wholly or partially from six to twelve months, and 22 per cent were cases of hyperlactation. Breast nursing for the mother for a period beyond twelve months can be regarded in no other light than as a severe physical strain, more especially when the hygienic surroundings are unfavorable. There is always the possibility of a supervening pregnancy, in which there will be a double strain. In the lower classes in England overlapping of pregnancy and lactation occurs in 24 per cent of all mothers. The effects are disastrous upon the next following pregnancy and the subsequent lactation. The practice of prolonged lactation is eminently unsatisfactory. The risks are real, and compensating advantages are conspicuous by their absence.

Osteogenesis Imperfecta.—

FENNER, E. D. *Archives of Pediatrics,* 23d year, No. 8, p. 583, August, 1906.

The patient was a boy aged five years and eight months with a comparatively large head, who walked, or rather hobbled, with the aid of a pair of crutches. The lower limbs were distally short and the feet everted. He was the sixth child in the family, all the others being normal so far as known. He was strong and healthy until four months old, when he was placed on condensed milk, which did not agree with him. He did not walk until he was two years old, and the fontanel was open until

the fourth year. At the beginning of his third year, shortly after beginning to walk, he had a trivial fall, which was followed by more or less pain. Soon the foot became everted and the hip prominent. Shortly after this a fall out of a hammock was followed by a soreness of the arm; later it was recognized that the radius was broken. After a period of variable duration, during which he was able to walk, he had another fall on the floor. He was then taken to a surgeon, who operated for a deformity of the right hip and eversion of the foot. The resulting union, owing to neglect on the part of the parents, was even more faulty than that which it was designed to correct. A skiagraph showed two fractures of one femur and one of the other, together with some displacement. The trochanters were pulled upward, and the shafts were both curved outward. Altogether only five fractures were known to have occurred, usually after trivial and in one case after no apparent traumatism. It was comparatively painless, healing without support of any kind and with little callus formation. These, together with the delayed dentition, retarded walking, and large fontanel, give the case close resemblance to those described by P. W. Nathan in the *American Journal of the Medical Sciences* for January, 1905, under the term osteogenesis imperfecta.

Convulsions in Children and Their Relation to Epilepsy.—

Moon, R. O. *Lancet,* vol. clxxi, No. 11 of vol. ii, p. 721, September 15, 1906.

The writer does not agree with Russell Reynolds that there is a sharp distinction between ordinary convulsions and epilepsy. Infantile convulsions do not necessarily pass on into epilepsy, but a larger number do so than is generally supposed. In the causation of infantile convulsions rickets and teething are the most prominent factors, the two being responsible for upwards of 27 per cent. Apparently the infectious fevers are not as important as some writers state. In a child subject to fits the occurrence of a specific fever increases their frequency. Heredity was an important antecedent in 29 per cent of the cases, but a larger number of cases associated with reflex conditions had a bad heredity than did those with idiopathic epilepsy. The prognosis is apparently no better in those cases having some connection with peripheral irritation which can be removed than it is in other cases. There is a somewhat greater hope in the reflex convulsions, but the scale does not incline so heavily to that side as is usually supposed. Contrary to the usual experience the writer found mental weakness in a rather larger proportion in cases arising from reflex causes than in the idiopathic. A larger proportion of the children suffered from moral impairment than those who showed intellectual deterioration. After all convulsions and petit mal attacks have ceased, it is not uncommon to find some nervous instability.

Diarrhea in Infancy and Early Life.—

Hance, I. H. *Journal of the Medical Society of New Jersey,* vol. iii, No. 3, p. 66, September, 1906.

Attention is called to the fact that diarrhea is a symptom and not a disease, and it is nature's effort to avert disease. It may be the beginning of an infection or an inflammatory process, and it should always be looked upon as a warning. In the beginning of an acute intestinal toxemia the degree of the diarrhea is no indication of the severity of the attack. The transition from the simple fermentative diarrhea to acute inflammation of the bowels is easy and often rapid. The younger the child the more rapid the change, and the more urgent the need of removing all causes which aggravate or induce a continuance of the inflammation. The most usual cause of infantile diarrhea is fermentation of the intestinal contents, though the trouble may in some cases be nerv-

ous, or there may be a typhoid fever. The treatment of diarrhea in early life involves a careful study of the diet of the individual infant. As a general principle the alimentary canal should be carefully cleansed, after which food should be withheld for twenty-four or thirty-six hours. The best remedies for clearing the bowels are calomel in small doses at hourly intervals, until one and one-half to two grains are taken. Castor oil may be given in full doses, repeated without hesitancy during the attack. Bismuth subcarbonate in large doses given in the old-time chalk mixture is also useful. Rectal irrigation, which at one time was very popular, is useful in certain cases.

Schonlein's Purpura.—

IBOTSON, C. B. *Lancet*, vol. clxxi, No. 3 of vol. ii, p. 159, July 21, 1906.

A case of this comparatively rare symptom-complex is described. It is important from the fact that it may be taken for an infectious disease. The boy was two years of age, and was first taken with a swelling of the prepuce, which was in a condition of cyanosis. Simultaneously there appeared large purple spots on the left thigh. The temperature was at first normal, but later rose to 100°, and a copious purpuric eruption appeared on the arms and legs. On the following day there was some urticaria. In the center of a few of the wheals there was a purpuric spot. The discolorations were confined to the extremities, and some of the patches measured one or two inches in diameter. On the third day of the illness there was a swelling of the left knee-joint and tenderness of all the bones, and on that day a purpuric eruption appeared on the face. After the purpuric patches faded they left a brown stain. On the fifth day the edema began to disappear, and by the tenth day the patient was convalescent. Schönlein's disease is characterized by a combination of wheals and purpura, the association being diagnostic if not pathognomonic. There is moderate pyrexia at the beginning of the illness, with swelling of the knee and prepuce.

Amenorrhea as an Early Symptom of Extra-pelvic Disease.—

MCGLINN, J. A. *Medical Bulletin*, vol. xxviii, No. 9, p. 323, September, 1906.

In studying menstrual disorders, attention should be directed to other than the pelvic disorders. If amenorrhea is due to a pelvic lesion there is probably a congenital absence or an underdevelopment of some of the pelvic structures. With this exception the majority of the cases of amenorrhea have their origin in general conditions. If amenorrhea comes on in a young woman in whom menstrual flow has been fully established, it is strongly suggestive of pulmonary tuberculosis. It may be the first symptom to appear while the general health is still excellent. The writer believes that in every case of amenorrhea the question of tuberculosis should be carefully considered. The blood examination is valuable, but it should not have too exclusive attention, as sclerosis is one of the earliest blood pictures in pulmonary tuberculosis. The apparent lessening of tuberculosis in America is probably due to the earlier recognition of tuberculosis, the two conditions having been formerly confounded.

The Weights of the Viscera in Infancy and Childhood.—

BOVAIRD, B., and NICOLL, M. *Archives of Pediatrics*, vol. xxiii, No. 9, p. 641, September, 1906.

The writers have studied the weight of the viscera in 571 cases, to if possible arrive at some idea of the size and weight of the normal viscera. It is recognized that the figures may not be applicable to healthy children, but as such inquiries are obviously impossible except in pathological material, it is thought that the number of observations, 571, may be sufficient

to obviate the effects of any one disease. The material is all carefully tabulated, and there is an especial study of the relation of the thymus gland to other organs. This structure presents extraordinary variations. The writers' conclusions are that the weight of the liver averages about seven times that of the heart. The weight of the spleen is about one-tenth that of the liver and the kidney averages about one-ninth that of the liver. The weight of the thymus gland as commonly given is excessive owing to the acceptance of pathological glands as a standard for normal conditions. The average weight of the thymus at autopsy is approximately six grammes. There is no evidence that the thymus gland grows after birth under ordinary conditions, but under special conditions the gland may undergo great hypertrophy.

Acute Suppurative Thyroiditis with Pressure Symptoms.—

MEARA, F. S., and MACGREGOR, R. S. *Archives of Pediatrics,* 23d year, No. 8, p. 591, August, 1906.

The rarity of this condition, in which pressure symptoms were relieved by intubation, justifies a somewhat extended report. The child was first seen when 3½ months old. The parents were healthy and in relatively comfortable circumstances. They had lost six children from various acute diseases, but apparently they bore no special relation to the present case. The disease began with a cervical adenitis, which suppurated and was incised. About three weeks after this there was a pneumonia, during which the thyroid gland began to swell, the condition being accompanied by fever and dyspnea. To relieve the dyspnea an intubation tube was introduced, which gave immediate relief. About a week later the swelling of the thyroid, which had become largely localized to the isthmus, was opened, and about an ounce of thick, yellow pus was evacuated. The child made an excellent recovery.

FORENSIC MEDICINE AND TOXICOLOGY.

Homicide by Aconite Poisoning.—

CAREL, H. C. *St. Paul Medical Journal,* vol. viii, No. 10, p. 666, October, 1906.

There is an apparent increase in the frequency of aconite poisoning for homicidal purposes. Heretofore the substance has been difficult of identification chemically and there is some uncertainty of its detection if some time has elapsed since death. The claim of Carel that he has identified the poison nearly nine months after burial is important. The circumstances attending this medico-legal inquiry were as follows: A farmer about 42 years of age, in apparent good health, died suddenly during the night. Slight suspicion attached to a farm hand who had given the farmer a drink of whisky the evening preceding his death. After some weeks the farm hand left the place and settled in North Dakota. About two months later the widow left her home on a visit and remained away some time. Accidentally it was learned that she was living during this time with her former husband's farm hand. This fact aroused suspicion and further investigation was ordered. The body was exhumed nine months after burial. The organs were somewhat decayed, but less than would be expected after so long a burial. The stomach contents were acid, as was the aqueous extract of the liver. The Dragendorff process was followed, using acetic acid and diluted alcohol as extractive agents, filtering and concentrating the extract to remove the alcohol.

After shaking out the acidified extract separately with petroleum ether, benzol, and chloroform, and obtaining no recognizable toxic residue, the chloroform was now removed by heat. The acid extract was made alkaline with ammonium hydroxide and again shaken out with petroleum ether followed by benzol. The benzol residue from both the liver and stomach

extracts yielded well-defined crystals which appeared to the naked eye as needles, but under the microscope as beautiful transparent prisms. A minute quantity of organic matter was present as evidenced by the slight brown tinge, but the weight was now taken:

Crystals from stomach .... .0006 gramme.
Crystals from liver ..... .0003 gramme.

A minute quantity of the crystalline residue was now rubbed on the tongue and gums. A bitter, tingling, and burning sensation suggested either aconitina or an aconitina-like ptomaine. The crystals were now carried through the hydrobromide and again recovered as transparent prisms weighing .0008 gramme. They were now taken up in alcohol. The alcoholic solution was divided into four aliquot parts and evaporated at room temperature. Each watch-glass should now contain .0002 gramme of the prisms. These were labeled *x*-crystals. At this point .0008 gramme of pure crystalline aconitina alkaloid was weighed out and similarly distributed on four watch-glasses, forming a series similar to those from the stomach and liver of the deceased. The two series were then subjected to the following tests:

The contents of one of the watch-glasses of *x*-crystals was dissolved in a calculated quantity of centinormal acetic acid and injected hypodermically into the foreleg of a mouse. In the same manner with a second hypodermic needle one of the series of known aconitina crystals was immediately injected into a second mouse of practically the same size. In five minutes the first mouse became uneasy. Soon convulsions, twitchings, and tremors passed through his body; the respiration became slower. The heart-beats became quicker, then irregular and weak. The convulsive movements continued intermittently until death occurred after one hour and thirty minutes. Practically the same symptoms were noted on the second mouse, which, however, survived to one hour and fifty minutes. Post-mortem examination showed congestion of the brains, lungs, and livers of both animals. The kidneys also of the first mouse were deeply congested, that of the second mouse slightly so. The entire bodies of both mice were now extracted, and an unweighable quantity of a substance which caused tingling of the tongue was obtained from each by the method formerly stated.

A second pair of watch-glasses were taken. The major portion of each was transferred to a melting point tube, a small piece of neutral moist litmus inserted in the open end, and the tubes heated over sulphuric acid. The known aconitina melted at 186°, the *x*-crystals at 186.8°. Vapor which turned the purple litmus red was given off from each tube. The residue on the second pair of watch-glasses was treated with nitric acid, with no color reaction. The remaining watch-glasses of *x*-crystals and of known aconitina were now covered, sealed, and put aside as exhibits. A report was sent to the coroner stating that the chemical evidence pointed to aconitina poisoning and requested a shipment of the entire body. After some weeks this was done, and the body delivered into the writer's hands by Dr. Spicer in person, 323 days after death.

The casket was of a metallic composition, and its seals were identified by the coroner in his presence. The body was clothed in a black suit with heavy white-wooled underwear and socks of the same material. The features were much sunken and moldy. Indeed, the entire body was covered with a gray mold and yielded a strong odor.

The various parts of the body were now removed and separately subjected to the Dragendorff process as stated above. All ex-

tracts were concentrated *in vacuo*. No attempt was made, however, to examine the bones, hands, feet, or hair, nor external organs except the greater muscles.

The results are tabulated below:

Part.	Reaction.	Weight.	Recovery.
Heart	Neutral	410 grammes...	Unweighable quantity.
Lungs	Neutral	300 grammes...	Unweighable quantity.
Kidneys	Neutral	350 grammes...	.0003 gramme.
Intestines, bladder, and contents	Neutral	1100 grammes..	.0006 gramme.
Fluids in the abdominal cavity	Faintly acid	220 grammes...	.0028 gramme.
Brain and spinal cord.	Neutral	.....	.0002 gramme.
Upper muscles	Alkaline	6720 grammes..	Nothing.
Ribs with intercostals	Alkaline	2840 grammes..	Nothing.
Lower muscles	Alkaline	11520 grammes	Nothing.

The identification of aconitina was absolute. The wealth of material at hand admitted every important test for this alkaloid. The physiological test with mice paralleled by known aconitina was repeated. The melting point 186.6° obtained. With cold nitric, no color reaction, but the residue tested with alcoholic potassium hydroxide yielded ethyl benzoate. With auric chloride the crystalline precipitate melted at 136° and the ignition yielded 19.86 per cent, Au corresponding to the formulæ $C_{33}H_{45}NO_{12}HAuCl_4$.

Further details of the identification are unnecessary. Suffice to say that every available test was made and the identification was unimpeachable. He draws special attention to the relatively large quantity found in the fluids of the abdominal cavity, whence they were removed by a prepared sponge. Reference to the table will show that from this usually neglected source was isolated a quantity of aconitina greater than that separated from the entire remainder of the body.

An inquiry similar in most respects to the above has just been completed on the body of a man buried 385 days before the examination was begun. As this case is yet to appear it will not be possible to give the facts which might identify the persons at present under suspicion of murder. I may only say that this body, that of an adult male, was roughly embalmed with a mixture of phenol, sodium chloride, and formaldehyde, and 385 days after was disinterred. The writer assisted by the county coroner removed the stomach, liver, kidneys, lungs, and brain, all of which were in good state of preservation, especially the brain, which, however, showed considerable congestion. The abdominal fluids also were taken up with a prepared sponge, and as in the previous case yielded the larger percentage of the poison. The quantities, however, were smaller, as shown by subjoined tabulation:

Part.	Reaction.	Recovery.
Stomach	Acid.	.0001
Liver	"	.0002
Kidneys	"	.0001
Lungs	"	Trans.
Brain (half)	Neutral.	Trans.
Abdominal fluids	Acid.	.0003

The methods of isolation and the subsequent identification correspond to the first case cited. This body was buried in a sandy soil on the upper slope of a hill. The coffin and grave clothes were in good preservation.

Before closing he briefly mentions two other cases of aconitina poisoning in which examination was made shortly after death. On the 16th of March, 1904, an adult named Frank Smith, of Fergus Falls, Minn., was taken with apparently acute gastritis, and continual vomiting set in. The pulse was rapid, temperature normal. Later convulsions set in, and he died in one-half hour. The coroner, Dr. D. E. Seashore, delivered the stomach and a portion of the liver for examination with the following statement of the post-mortem appearances on the day following the death: "Rigor mortis partially disappeared; abdomen bloated; lungs crepitate; hearty flabby, no clots; pericardial fluid and valve normal; dia-

phragm shoved up to top of fifth rib; mesentery and liver normal; gall-bladder half full, color normal; omentum raised; small intestines dilated; stomach distended; kidneys, ureters, and spleen normal."

Aconitina was separated from both stomach and liver by the Dragendorff method as transparent prisms, identified by the tingling sensation, melting point, animal test, and the formation of ammonium di-amido benzoate.

In August of the same year a certain railroad conductor and his wife died under peculiar conditions in Grand Forks, N. D. A children's party was in progress at the house. One of the boys had occasion to go to the bath-room; the door was just ajar; pushing it open he saw the figure of an adult man lying prone on his back in the bath-tub entirely disrobed. Kneeling on the floor with her head resting on her hand at the edge of the tub was a woman, likewise entirely disrobed. The frightened boy screamed; then seeing they did not stir rushed into the bath-room and tried to lift up the woman. Her body was yet warm but quite dead. The man also was dead, but his body cold.

On the closed seat stood a jug of cider. Investigation followed. The stomachs and livers of both deceased were sent for analysis, also the jug of cider. Aconitina was found in both organs of both the dead, but not in the cider.

Several other cases of apparent aconitina poisoning have come under observation, but the quantities recovered were unweighable and not sufficient evidence to warrant positive testimony. He subjected several animals to large doses of this alkaloid and buried their bodies, which will be exhumed at periods of three, six, nine, and twelve months in order to farther confirm the apparent evidence of the post-mortem persistence of aconitina in the human body as indicated by the first two cases mentioned in this paper.

Avulsion of the Penis.—

BIONDI. *La Clin. Mod.,* An. 12, No. 18; *British Medical Journal,* p. 26, August 18, 1906.

The writer reports the case of a man, aged 64, whose penis was pulled off by an energetic young woman with whom he had attempted sexual intercourse. The case was brought into court, and different versions were given by each party as to how the thing actually occurred, and as the possibility of avulsion of the penis by manual traction is of considerable forensic importance, certain experiments were made with a view to elucidate the question. In the first place, it was found that the nature of the injuries sustained in the case were exactly similar to those which were brought about when the penis was forcibly avulsed. In the second place, the amount of force required to tear off the penis in a state of flaccidity was far in excess of that which any ordinary person would be likely to possess. But when the penis was erect (in the cadaver this was accomplished by injecting sodium chloride solution direct into one corpus cavernosum) the resistance (which was chiefly due to the tunica albuginea) was very much reduced, so that a comparatively moderate amount of force, quite within the possibility of a woman of average strength, was quite sufficient to completely avulse the penis. The woman's story was that the man tried to seduce her, and that in self-defense she pulled forcibly at the penis, which came off in the struggle.

Proximate Cause of Death—Septicemia After an Injury.—

Journal of the American Medical Association, vol. xlvii, No. 7, p. 536, Aug. 18, 1906.

The Supreme Court of Wisconsin in Carey *vs.* Preferred Accident Insurance Company, New York, held that the provision exempting the defendant from any liability for any injury resulting from any poison or infection was not applicable to blood poisoning following an

injury. The facts in the case were that the deceased fell, sustaining an abrasion of the skin on the right leg. On the second day it appeared somewhat red and inflamed, and by the eighth day there were well-marked symptoms of blood poisoning, and death on the tenth day. The evidence showed that the abrasion was the portal of entrance of certain pathogenic germs which were the immediate cause of death. In discussing this proposition the court said that responsible causation as applied in law is not dependent on time, distance, or a mere succession of events. After an injury is inflicted by an event which has set in motion all the succeeding agencies sharing in the result, then such is held to be the proximate cause of the injury.

Lay Opinions as to Sanity.—

Journal of the American Medical Association, vol. xlvii, No. 12, p. 965, September 22, 1906.

The Supreme Court of Kansas says in the case of Kempf *vs.* Koppa that an unprofessional observer is competent to form a judgment and express an opinion on the sanity or insanity of one he knows. A fundamental qualification is that the witness shall have had adequate opportunities of observation. The value of the testimony depends on the extent of the opportunity as well as the power and habits of observation possessed by the witness and a consideration of all the circumstances under which the opinion was formed. The courts do not undertake to lay down a definite rule as to how close the witness must have observed the person whose sanity is the subject of inquiry; even a casual observer may discover manifestations that would make his testimony valuable. Whether there is a fair basis for an opinion by a witness must be left largely to the trial court, and the jury taking note of the opportunity and powers of observation of the witness must decide what weight and effect shall be given to his opinion.

PUBLIC HEALTH.

Venereal Prophylaxis.—

WOLBARST, A. L. *Boston Medical and Surgical Journal,* vol. clv, No. 11, p. 280, September 13, 1906.

The writer in a well considered article discussing the prophylaxis of venereal disease suggests the following special lines of attack:

(1) As family advisers, medical men are in a position where they can talk and act frankly. The physician should use his influence, wherever possible, to see to it that his patients about to marry are not suffering from the remains of former venereal infection; and fathers of young women who are about to enter the new life should be taught to demand of their daughters' prospective husbands a clean bill of health, signed by a reputable physician, after a careful examination. The public should and can be educated up to this requirement.

(2) There should be severe legal penalties against men or women who marry, knowing that they are still suffering from infectious venereal disease.

(3) Those who are infected with syphilis, gonorrhea or chancroid should be taught by their physicians the dangers of infecting innocent persons with whom they may come in contact, and should be instructed how to avoid this risk. A brief, well written, and plainly worded little pamphlet or tract should be given to every patient in private or institutional practice.

(4) Barbers, dentists, manicures, chiropodists, nurses, midwives, and physicians too, should be reached by a systematic campaign of instruction and warned about the care of their hands, instruments, dressings, and utensils, so as to reduce to a minimum the possibility of transferring infection from one patron to another and to themselves.

(5) Waiters, bartenders, and others who

serve and prepare food and drink in public places, and their employers as well, should be similarly reached and warned and instructed as to the importance of cleanliness, not only of their own persons, but of the dishes and utensils they handle. The abominable and dangerous practice of removing cups, glasses, etc., with the fingers inserted inside the vessel should be broken up. The public should be warned of the dangers lurking in bar glassware, etc., and should demand that the most scrupulous cleanliness be employed in hotels, restaurants, and cafés. The filthy roller-towels found in these places should also be abolished.

(6) Occasional medical examinations of persons engaged in the preparation and serving of food and drink should be encouraged, to determine the presence of possible infectious disease.

(7) Nurse-girls, domestics, and maids should not be permitted to sleep in the same beds with children, for obvious reasons.

Antitetanic Serum as a Prophylactic.—

SCHERCK, H. J. *Journal of the American Medical Association,* vol. xlvii, No. 7, Aug. 18, 1906.

The striking results achieved by Scherck in preventing an epidemic of 4th of July tetanus in St. Louis strongly suggests the measures which should obtain all over the country. A few days before the 4th a large amount of the serum was obtained, put up in packages of 10 cubic centimeters, with everything complete and thoroughly sterilized, and kept in an ice-box at a suitable temperature. Instructions were given to the dispensary physicians. Beginning about the 4th and extending to about the 7th of the month, 170 cases were treated in the city dispensaries (a list of these is given). They included almost every possible 4th of July injury, but not a single case of tetanus developed; repeating in this the experience of the previous two years, in which the serum was employed. In 1903, before the use of the serum, 56 cases were treated, with 16 deaths from tetanus. In 1904-5, 37 and 84 cases respectively, with no deaths, and in the present year 170 cases, as stated. To test the efficacy of the serum four guinea-pigs were inoculated with the minimum lethal dose of tetanus toxin. Two of these were treated with the minimum protective dose for their weight, and a third with four times this amount. The fourth pig received no protective injection, and showed tetanic symptoms in sixteen hours after the inoculation, and died eight hours later. None of the others showed any symptoms whatever of tetanus. In the dispensary patients treated, in a few cases, there was a slight rise of temperature on the day following the injection, but no other symptoms were produced. In a few cases the injection was made in from two to four days after injury, and still proved prophylactic. Dr. Scherck trusts that the practice of using this antitoxin will become general throughout the United States, and thus minimize the bad effects of 4th of July enthusiasm.

The same *Journal* has its fourth annual report on the frequency of 4th of July injuries and tetanus. There were 89 cases of tetanus resulting from 4th of July injuries this year, of which 75 cases were reported fatal. Three patients recovered, and in 11 cases the results are not known. There were 83 deaths from other causes, or a total of 158 deaths. There were 5308 non-fatal injuries, making 5466 dead and injured, an increase over last year of 290. Tetanus seemed to have been somewhat more prevalent than in previous years, since, although the cases due to fireworks were fewer, there was an increase in the number of cases due to puncture wounds from nails, splinters, crushed wounds, etc. Antitoxin was more generally used than ever before, hospitals having been provided with a liberal supply by health authorities. Some cities claim to have

practically prevented tetanus by its careful use. Its chief value, apparently, is as a prophylactic. After the main symptoms of lockjaw have begun it seems to have very little value, since in only three cases out of 89 are patients reported to have recovered. In one of these, which was very persistent, antitoxin was administered as often as ten times each day, with recovery as the result. The duration in this case was about thirty days between the time of the accident and the subsidence of the symptoms.

Public Supply of Pure or Especially Prepared Milk for the Feeding of Infants.—

McCLEARY, G. F. *Lancet,* vol. clxxi, No. 7 of vol. ii, p. 422, Aug. 18, 1906.

A proper milk supply is the most important element in lessening infant mortality. While it is true that the majority of infants are breast-fed, it is the mortality among the hand-fed babies that furnishes the enormous infantile death-rate. One of the most important elements in reducing this mortality is to encourage breast feeding, and any efforts to supply a pure milk should have this in mind. The public milk depots should have facilities for weighing infants and observing their progress, as is done in the French *goutte de lait.* Nursing mothers should also be encouraged to bring their infants to the milk depot to be weighed, and in this way a continuation of breast feeding can often be secured. Medical supervision of infant feeding by the public health authorities is an important measure for preventing infantile mortality. In most British milk depots the milk is either sterilized or pasteurized, but these together with centrifugalization or filtrations are only makeshifts. That they can all be avoided by proper control of the dairy by care in harvesting and distributing the milk has been shown by the municipal infants' milk depot at Rochester, New York. These matters are not only valuable in themselves, but they furnish an object-lesson of utmost importance to the dairy farmer. One model municipal dairy farm managed on scientific methods would do more to promote the production of pure milk than any number of reports and papers on the question of the milk supply.

Japanese Naval Sanitation.—

TAKAKI, K. *Medical Record,* vol. lxx, No. 9, p. 331, Sept. 1, 1906.

The writer shows from statistics of the Japanese navy that it appeared in 1880 that if beriberi could be wholly exterminated the number of losses from illness would decrease from 24.09 per thousand to 13.66. The improved hygienic condition of this great navy at present depends upon certain developments which have taken place since the establishment of the naval medical bureau in 1872. It was some years later, however, before the records began to be essentially helpful and valuable. The writer declares that the present condition of the imperial Japanese naval hygiene was due to having had an able man at the head of the navy, and also to the education of the medical officers. In order to maintain the health and efficiency of the men a careful selection is made at the time of enlistment, and the maintenance of the health is attended to with the most careful detail. To attain these objects the writer declares that there must be an organization in which the medical officers and nurses must be properly educated for their duties, while the officers and men of other branches must be taught elementary physiology and hygiene. Operations are avoided as much as possible, for the Japanese have found that conservative surgery is most efficient. In both army and navy before a battle men bathe thoroughly and dress themselves in new clothing.

MEDICINE

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EDITORIAL.

VALEDICTORY.

With this issue MEDICINE will cease to exist as an independent publication, having been consolidated with the *Therapeutic Gazette*.

This publication was established in 1895, since which period twelve annual volumes have been issued. From the time it was first published it has been under the sole editorial charge of the senior editor, who has prepared nearly all of the editorials, most of the book reviews, and practically all of the abstracts, hence he alone is to be held responsible for any errors that may be found in its pages. When the journal was first established it was understood that the editor should have an absolutely free hand in directing the policy of the journal, and he alone should decide what should go into its columns. For the first two years he undertook to censor the advertisements, stating what should and what should not be received. His limited knowledge at that time of what constituted ethical advertising finally led him into so many contradictions that he refused to have any supervision of the advertising pages, frankly turning them over to the publisher. This covenant was faithfully adhered to by the successive publishers.

The policy of the journal throughout its entire period of publication has been consistently maintained. While its editorial pages have never been colorless they have largely avoided controversial subjects, and mere personalities have never been allowed to intrude.

In finally severing his connection with MEDICINE and in retiring from the editorial field, the editor does so with profound regret. He looks back with great pleasure on an editorial connection that has brought him in contact with the contributors of this journal, with many of its subscribers, and to many pleasant associations with his fellow craftsmen. He is, however, in hearty sympathy with the sentiment of the American Medical Editors' Association, who claim that once a medical editor always a medical editor, and he looks forward with great pleasure to this *ex officio* connection with the craft.

He desires in this connection to express a deep appreciation of the loyal support given him by the publishers of MEDICINE—Mr. Geo. S. Davis, the late Wm. M. Warren, and Mr. E. G. Swift—a connection which began as a simple business arrangement and has grown into far more cordial relations, which it is his

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

All communications relating to the business management of MEDICINE should be addressed to E. G. Swift, Publisher, Detroit, Mich.

earnest wish should continue. It is with pleasure that the editor acknowledges the highly valuable assistance given him by the associate editor, Dr. Joseph McFarland, throughout the later years in which this publication was issued.

He bespeaks for the consolidated journal the support of those writers and subscribers who have contributed so efficiently toward making MEDICINE a scientific and progressive publication.

A SIMPLIFIED METHOD OF BLOOD COUNTING.

E. V. Murphy and G. T. Strodl (*New York Medical Journal,* Oct. 27, 1906) have made a comparison between the Einhorn-Laporte method and that of Thoma-Zeiss. The first method is simpler. It does not require fresh blood, and the counts can be made either at the bedside or at the office. The Einhorn-Laporte method is described by the originators as follows:

Starting from the supposition that in carefully prepared specimens the distribution of the blood elements, according as their number is larger or smaller, will vary correspondingly, we decided to count all the red as well as all the white corpuscles in a certain square area of the dried specimen and to compare the results thus obtained with those of the Thoma-Zeiss counter. As the unit of the square area counted we have taken a square millimeter. The number of red and white corpuscles contained in a square millimeter is calculated from the fields counted, and this result is then compared with the number of blood cells contained in one cubic millimeter as determined by the Thoma-Zeiss apparatus.

For making this determination we have found a medium-power dry objective (DD or E of Zeiss, or 5, 6, or 7 of Leitz) most practical. With objective DD and eyepiece 2 the whole visual field comprised 0.25 square millimeter. The field area can easily be determined for each objective and eyepiece, according to the well known algebraic formula, which makes the square area of a circle equal to $r^2 \times 3.1415$; r = radius of the circle. The radius of a visual field is determined by means of a fine stage micrometer or the division in the Thoma-Zeiss counting chamber, or, given the magnification, by measuring the apparent size of the field at 250 millimeters visual distance and dividing the number thus obtained by the magnification.

Objective DD and eyepiece 2 were used for counting the white cells. As it would be impossible to count also the more numerous red cells in so large a field, we contented ourselves by counting only a certain known fraction of the field. For the sake of still further reducing the field we inserted in the eyepiece a glass diaphragm, the center of which is marked off accurately in an area 3 millimeters square. This is again subdivided into four equal squares. We might give to this contrivance the name "blood-counting diaphragm."

After preparing the cover-glass specimen and selecting a suitable area, as described, we count with objective DD and eyepiece 2 all leucocytes visible in the field. Then count the erythrocytes visible through one or more squares of the measured area of the diaphragm without moving the specimen. This procedure is repeated until about six square millimeters (24 fields) have been counted. From these figures the number of leucocytes and erythrocytes in one square millimeter of the cover-glass specimen is calculated. All we have to do now in order to obtain the number of corpuscles in a cubic millimeter is to multiply the number counted in one square millimeter by the average factors (500 for red and 400 for the white cells).

Murphy and Strodl have carefully compared the blood counts in ten cases made by these two methods, and find that there is a substantial accuracy between them, the difference not being greater than is obtained by successive counts in the same individual with the Thoma-Zeiss apparatus. The advantages claimed for the newer method are rapidity, simplicity, and the fact that a differential count of the leucocytes can be made at the same time. For rapid work at the bedside the newer method would apparently greatly facilitate diagnosis, as the writers say that when familiarity with the plan is established a few moments' observation will at once determine a leucocytosis, or that the erythrocyte count is markedly diminished. In fact, those who are familiar with the method can by a rapid examination of a dozen fields determine whether a specimen is normal blood or one in which a careful count is required.

THE BASLE ANATOMICAL NOMENCLATURE.

The crudities in anatomical nomenclature have long been recognized, but it was not until 1895, at the meeting of the Anatomical Society in Basle, that definite order was evolved by the adoption of 4500 anatomical names. Since that time the system adopted has been known as the Basle anatomical nomenclature, or as it is abbreviated, B. N. A., the *nomina anatomica*. The reasons for the adopting of these names and their more extended use both in teaching and in writing are fully explained in Dr. Llewellys F. Barker's forthcoming book on "Anatomical Terminology," advance sheets of which have been recently issued by P. Blakiston's Son & Company. The reason for the simplification of anatomical terms is obvious. According to Barker the larger text-books on gross anatomy contain as many as 10,000 names, at least half of which are synonyms. If the anatomical terms used in various standard text-books are collected into one list, the total number amounts to more than 30,000. It is looked upon as a remarkable achievement that the necessary number of names in gross anatomy can be reduced to less than 5000. Even more important than mere reduction in number is the elimination of obscure and ambiguous terms. Barker gives an exceedingly interesting account of the haphazard manner in which anatomical structures had been christened. Each investigator gave names as he would to the parts studied, and as one investigator was often ignorant of the work done by others, different names were given to the same structures. The multiplicity of names found expression in such triplicates as pneumogastric nerve, vagus nerve, and eighth cerebral nerve. The laryngeal prominence was also known as Adam's apple, and the use of proper names still further burdened the memory, such as the valvula coli, which were known variously as the valvula ileocecalus, valvula Bohini, valvula Tulpii, valvula Fallopiæ.

An immense labor was performed by the committee covering a period of over five years. The general principles formulated by them were that each part should have only one name; each name should be in Latin and be philologically correct; each name should be short and simple as possible. The names should be merely memory signs, and need lay no claim to description or to speculative interpretation. Related names should as far as possible be similar, and adjectives should in general be arranged as far as possible as opposites. In a few instances these rules have been disregarded, as, for example, in the mitral valve, correctly known as the valvula bicuspidalis, valvula mitralis being retained as a

concession to the clinicians. The great names in anatomy, such as Fallopia, Eustachi, Malpighi, have been retained. Poupart's ligament becomes ligamentum inguinale (Pouparti). Comparatively few names had to be coined, the labors of the committee having been restricted to the selection of the best term available.

A CONTRACT AGAINST FUTURE PROFESSIONAL COMPETITION.

Medical partnerships have sometimes proved unsatisfactory, often leading to lifelong enmity of practitioners in the same community. The same strained relations often arise between established practitioners in a community and those whom they have employed to assist them. Such an assistant frequently, ungrateful for many favors bestowed, will, after the termination of the period for which he is employed, settle in the immediate neighborhood and attempt and perhaps succeed in getting a considerable proportion of his employer's practice. Considerations of this kind undoubtedly prevent many a man from employing assistants who would otherwise be glad to do so, to the manifest disadvantage of his clients, of himself, and to many deserving young men in the profession, who are sadly needing the training and experience which would come with two or three years' service with an active practitioner. The Supreme Court of Tennessee (*Journal of the American Medical Association,* Sept. 29, 1906) says in Turner *vs.* Abbott that a contract in restraint of such competition is valid. It was contended in this case that such contract was not valid unless the party at the time had an established practice or mercantile business that was made the subject of sale. The court held that there were numerous English and American cases where a clerk or employee, teacher or salesman, on entering the service of a tradesman, manufacturer, or professional man has been bound by a lawful contract not to engage in a competitive business with his employer. The facts in the case were that an assistant dentist had been employed at a salary of $100 per month, and he agreed and did make a contract that he would not open an office or practice dentistry in competition with the complainant where the latter then was located and its immediate vicinity. The court held that this contract was reasonable and not oppressive, nor was it in any way detrimental to the interests of the public. It held that such a contract is not in unlawful restraint of trade or against public policy, but is valid and enforcible. The general rule deducible from the authorities is that a contract in general restraint of trade—that is, not to engage in one's trade or profession in any place in the realm—is void, being contrary to public policy, but a contract not to engage in one's business or profession at a particular place or for a period of time is not invalid, but such contracts will be upheld and enforced.

MACROSCOPIC AGGLUTINATION OF THE TYPHOID BACILLI.

In this issue will be found an article by A. M. Stober describing a practical application of the Widal test. This reaction is one of the most important of the single laboratory methods that have been suggested of late years in the clinical diagnosis of typhoid fever. As ordinarily performed the test requires a good microscope and some skill in the application of laboratory methods, and what is more important, a pure culture of the typhoid bacillus. The test consists in observing the agglutination or clumping of the bacilli when brought in contact with the patient's blood. The test is not conclusive, as there are some cases in which the test is positive when typhoid is not present,

and a few cases in which the characteristic reaction is absent in undoubted typhoid. Notwithstanding the few exceptions the test is very reliable, and particularly so when the ordinary clinical picture of typhoid is found—as a confirmatory test.

Additional interest is lent to this test by the fact that it can be made without a microscope or laboratory. The dead bacilli may be kept in suspension in sealed tubes for an indefinite period, and when needed the serum of the blood can be added to the tube, and in a short time the clumping will be observed, providing the reaction is positive. No microscope is needed to observe the reaction.

Stober says that the Widal test performed in tubes and relying upon unaided vision is almost as delicate as the microscopic test. It is to be hoped that physicians will more generally avail themselves of this test. A practical and simple application of the method was devised by Parke, Davis & Co., who furnish the preserved dead bacilli in proper dilution in tubes contained in a convenient case which can be carried in the pocket, and can be used at any time when the test is desired.

THE APPARENTLY HOPELESS CASES OF TUBERCULOSIS.

What to do with this unfortunate class is one of the pressing medical problems. These patients are frankly told that they are not wanted in the modern sanatorium, the general hospital has no place for them, and the most that is promised is that they shall be registered and taught how to care for their sputum, so that they may avoid infecting the family and those associated with them, and how their belongings should be disinfected after death.

Recoveries in apparently far advanced cases are by no means rare. In a recent article S. G. Bonney (*New York Medical Journal,* Oct. 27, 1906) cites a series of ten cases in which there was apparently permanent arrest of the tuberculous infection after the patient had passed into a seemingly hopeless condition. The cases cited by the writer, as well as those that have been frequently reported in the past, confirm what has already been recognized, that even very advanced cases of this disease in which the prognosis is apparently hopeless may recover. Of course this does not argue that they should be admitted to sanatoria or associated with recent cases of the disease, but the results in the treatment of such cases, while not nearly so brilliant as those obtained in the more recent infections, justify a very earnest effort for the relief of these unfortunates.

RESTRICTING EXPERIMENTAL TREATMENT IN THE HOSPITALS.

A correspondent of the *Lancet,* writing from Vienna, says that there has been an animated discussion before the Vienna Medical Union on certain regulations which have been issued by the Minister of the Interior regarding new methods of treatment in hospital cases. They direct that the patient must be previously informed of the fact that he is the subject of an experiment and he must give his consent, and that a record must be kept of the details, including the names of the experimenters, assistants, and patients. The director of the clinic or ward must either be present or must in some way supervise the whole proceedings, and a full report must be sent to the hospital director. Novel surgical operations must have been tried on animals before being employed for patients. Such methods may, however, be used in cases of emergency if previous methods of operating are dangerous or are likely to be unsuccessful. On the whole the correspondent approves of the regulations, which he says will not materially limit the scientific work now

being done in hospitals, but may put an end to some indefensible experiments which are made now and then.

There is a feeling among the laity that they are too often the subjects of experimental treatment. Nothing could be farther from the facts. Now and then there may be an ill-advised experiment performed or an operation which is unjustifiable may be performed, but the body of the profession is essentially conservative, and if the public as a whole suffers from anything it is from the routine repetition of old methods simply because they are old and not because they are the best.

IMPRISONMENT FOR DEBT.

The September 29th issue of the *Lancet* calls attention to the frequency with which people are imprisoned for debt in England. The number of "judgment debtors" sent to prison in 1905 amounted to 11,405, about three times the number imprisoned on the same judgments during 1875. The *Lancet* refers to the disastrous consequences of such an act; while it may have a seemingly deterrent influence upon those who contract debts and wilfully refuse to pay them when they are able to do so, it is pointed out that if the right to imprison for debt was taken away tradesmen and others would be more careful in extending credit, or else would refuse to do so altogether, a direct incentive to cash trading which is said to be altogether salutary. It is pertinently remarked that prison is prison no matter what the cause which places a person within its walls. Many prisoners mean many miserable homes, much privation, and much disease.

KOPLIK'S SPOTS.

H. G. Langworthy (*Medical Record,* Oct. 2, 1906) calls attention to the value of these spots in the early diagnosis of measles. He believes that if they are carefully looked for it would result in such an early diagnosis that epidemics of this disease would be practically impossible. The appearances presented are quite characteristic—a pearly-white spot on the reddish background of the mucous membrane. The most frequent site, and where they are easiest detected, is just within the angle of the mouth and along the mucous membrane which is in contact with the gums. It is essential that the examination should be made in a strong, clear light. Reflected light is not the best, but direct light from a white cloud gives the best means of distinguishing them. As soon as the exanthem develops the spots begin to fade, and when the skin eruption is well developed the spots can no longer be seen.

ORIGINAL ARTICLES.

THE WAY OF INFECTION IN TUBERCULOSIS.

BY LAWRENCE F. FLICK, M.D., PHILADELPHIA.

The way of infection in tuberculosis should be studied from three points of view: (*a*) The exit of the tubercle bacillus from a host; (*b*) the existence of the tubercle bacillus outside of a host; (*c*) the entrance of the tubercle bacillus into a host. Only in this broad light can a correct idea of the subject be obtained.

The exit of the tubercle bacillus from a host is (*a*) through broken-down tissue; (*b*) through excretions; (*c*) through secretions. The mature bacillus goes out through broken-down tissue, and in the natural order of things this probably is the mode of exit of greatest importance in the life-history of the tubercle bacillus.

Looking at the tuberculous process from a biological point of view, the emptying out of a caseated mass may well be considered as the completion of the cycle—the harvest time. The bacillus has completed its work in the host and is thrown out to await entrance into a new host or reëntrance into the same host. It is thrown out, moreover, in a protective covering of dead cells which serve as a cache, preserving it under adverse conditions. Myriads of bacilli are thrown out in this way by advanced consumptives.

Tubercle bacilli also are thrown out of a host by the excretory organs, but perhaps not always in a viable condition. The kidneys are eliminators of tubercle bacilli, but other organs probably also take part in this process. That tubercle bacilli are eliminated by the kidneys has been proven by Walsh in his work at the Phipps Institute, where he has been able to successfully inoculate guinea-pigs with the urine of patients who at autopsy had no microscopic lesions in the kidneys. Walsh's work remains to be confirmed by others. If the kidneys can eliminate tubercle bacilli it is probable that the large intestine has the same faculty, but in support of this we have as yet nothing but analogy. There is some reason for believing that issues in the body such as secreting cavities, suppurating glands, and fistulæ may eliminate tubercle bacilli. The subsidence of tuberculous toxemia during the activity of such issues and the return of the toxemia when such issues are temporarily blocked up gives support to such a view.

Of the secretions of the body milk at least can carry out tubercle bacilli. Successful implantations of tuberculosis with milk of cows in which no macroscope evidence of tuberculosis exists in the udder have been made by Ravenel, Theobald Smith, and others. The evidence here is too strong to permit of doubt any longer.

The existence of the tubercle bacillus outside of a host is perhaps the most important part of this subject. Much false doctrine has been preached about this matter, and most people hold erroneous ideas about it. The ubiquity of the tubercle bacillus has been the prevailing doctrine, and nothing has done more harm to the cause of the prevention of tuberculosis than this doctrine. It has strangled enthusiasm for the prevention of the disease at

its fountain head by producing despair of dealing with a microörganism which exists everywhere.

In the light of our knowledge about the tubercle bacillus the doctrine is undoubtedly erroneous. It is probable indeed that the existence of a viable tubercle bacillus is exceedingly restricted. The tubercle bacillus is a delicate organism and does not preserve its viability very readily. Even when cached in dead tissue it does not preserve its viability long in the open where it is exposed to rain and sunshine. The weather soon shells it out of its cache by maceration and oxidation, and the light kills it. In enclosures it maintains its viability for a longer or shorter period, according to the amount of light and moisture present. In dark, ill-ventilated enclosures it probably maintains its viability for years; at least clinical observations seem to indicate that a house which has been occupied by a consumptive who has not practiced efficient preventive measures can convey the disease a year and perhaps even years afterward.

Whether or not the tubercle bacillus can maintain its viability for any length of time in excretions or secretions has not been established. The probabilities are that it cannot on account of bacterial activity in such substances. The fermentative process in excretions and secretions when these have been separated from the organism which gives them off destroys the bacillus.

From a practical point of view the real source of seed supply for new implantations of tuberculosis probably is the house. Dwelling-houses, factories, and workshops of various kinds are the chief storage places for the viable tubercle bacillus. The things which go with such places—furniture, carpets, draperies, clothing, and so on—undoubtedly serve as fomites for the spread of tuberculosis, as they can become carriers for the viable tubercle bacillus. A place which is or has been occupied by a consumptive, or a thing which has been in such a place or has been used for a considerable time by a consumptive, is an active factor in the spread of the disease.

The mode of entrance of the tubercle bacillus into the system is of importance, though perhaps secondary. Practically we know that when a sterile receptive host is in contact for a sufficient length of time with a place or thing which is infected with tuberculous matter he gets an implantation. By what channel the bacilli get into the system we do not clearly understand. We agree that the bacilli can get in by way of the skin, the alimentary canal, and the respiratory tract, but as to the relative frequency of entrance by these channels there is a wide divergence of opinion, fortunately of academical interest only. According to the laws of physics and physiology, entrance of solids into the body is by way of the lymphatic system, whether the port of entry be the skin, the lungs, or the alimentary canal. The tubercle bacillus being a solid must therefore go into the system by way of the lymphatics, whatever port it may enter.

The skin as a port of entry is of little importance from a practical point of view. Theoretically the skin may be the port of entry, but practically it rarely is. When it is the disease usually is localized in the skin. It does not follow, however, that the skin has been the port of entry in all cases of skin tuberculosis.

The lungs have been looked upon in the past as the chief port of entry of the tubercle bacillus, probably because they have been most frequently recognized as the seat of the disease. From the outside to the inside of the lungs seems a short distance, and the communication between the outside and the inside is so constant that it is easy to jump at the conclusion

that this must be the port of entry of a disease which so frequently affects the lungs. The reasoning is illogical, however, and the conclusions are not based upon laws of physics and physiology.

The respiratory tract is for gases and is a difficult way of entrance for solids. The construction of the nose and pharynx, indeed of the entire respiratory tract as well as that of the mucous membrane, is such as to oppose the entrance of solids and facilitate their ejection when they have entered. Even when solids have passed all barriers and are deposited on the mucous membrane of the bronchioles, they cannot gain entrance into the parenchymatous tissue except through the lymphatic system. The lymphatics take them up and carry them into the nearest lymphatic glands, where progress is opposed, and if they break through these glands there are still others which serve as barriers to obstruct the entrance into the inside of the organism. If a solid gets into the organism by this way at all it must enter through the pleura or by way of the thoracic duct and the right heart into the circulation. Entrance of tubercle bacilli into the system by way of the lungs is therefore over a long route instead of a short one. The old idea that the bacilli go directly into the circulation through the mucous membrane, or that they grow upon an abraded surface of the mucous membrane and from there extend into the parenchymatous tissue of the lungs, has been practically abandoned.

Entrance of the tubercle bacillus through the alimentary canal is perhaps the most natural mode of ingress, because it is in harmony with the laws of physics and physiology. The alimentary canal is the natural channel for the entrance of all solids, and is so constructed as to facilitate their entrance. That the tubercle bacillus can speedily and conveniently get into the circulation by way of the alimentary canal and the thoracic duct cannot be doubted from a physiological point of view, and has been amply demonstrated experimentally by Gerlach, Ravenel, and others. The bacilli are taken up by the lacteals of the intestines and carried through the lymphatic glands into the thoracic duct, and from there conveyed through the right heart into the circulation. Once in the circulation they find the place of least resistance in the body and colonize there. This explains many phenomena in the development of tuberculosis which otherwise are unintelligible. Among other things it explains why the primary seat of tuberculosis may be in any part of the body which is reached by the circulation. It also makes intelligible the frequency with which the lungs are the primary seat of tuberculosis, since the lungs act as a sieve for the contents of the thoracic duct before these go into the general circulation.

It has not yet been determined by what route tubercle bacilli gain entrance most frequently. Formerly it was believed that the respiratory tract was the ordinary port of entry; more recently there is a strong trend of opinion toward the view that the alimentary canal is the most frequent port of entry. It may never be possible to determine accurately which of these two ports of entry is the most frequent, as the difficulties in the way of determining such a fact are very great. Recent studies would lead one to believe, however, that the ordinary mode of entrance, as has long been believed, is by way of the respiratory tract—not direct, however, but indirect, through the lymphatic channels, particularly through the lymphatic ducts draining the nose, pharynx, and bronchioles. To my mind the strongest argument in support of this view is the extreme chronicity of what may be called the incubation stage of tuberculosis. More

and more evidence is accumulating all the time to prove that in the majority of cases the tubercle bacilli are implanted early in life and remain dormant in the lymphatic system until the invaded host receives some severe shock to his physical well-being by disease, dissipation, or hardships of life. Clinically few cases of tuberculosis develop symptoms of sufficient magnitude to attract attention until the disease has existed for a number of years in a dormant condition. Autopsies moreover show that many people who die of other diseases have lymphatic tuberculosis. In view of these facts it is not likely that the disease is often implanted through the alimentary canal, because if the disease were implanted through the alimentary canal by way of the thoracic duct and right heart through the circulation it ought to run a more rapid course. One can scarcely conceive it possible that a colony of tubercle bacilli could be planted in the parenchymatous tissue of the body anywhere without rapidly developing and setting up some toxemia.

All children in a house in which tuberculosis exists and in which efficient preventive measures are not practiced probably get an implantation of the tubercle bacillus in the lymphatics through the respiratory tract, and the disease remains dormant in these children for a longer or shorter period of time, according to the conditions of life under which they live and other diseases encountered. Each member of such a family develops tuberculosis, if he develops it at all, according to his personal equation in resistance of depressing influences of various kinds. Some throw off the disease and become completely sterile, no doubt, but many carry the microörganism through life, and either develop the disease in a fatal form or maintain it in a dormant condition.[1]

[1]Since this paper was written Dr. Calmette's work has been made public and goes far to prove that the alimentary canal is the usual mode of entrance.—L. F. F.

In this connection it is worth while to give special consideration to the tonsils and the lymphatic tissue of the nasopharynx. These play an important rôle in the implantation of tuberculosis during childhood, and in the past we have not given sufficient attention to them in relation to implantation of disease generally. Hypertrophied lymphatic tissue in the nasopharynx, to which category the tonsils belong, is probably an evidence of the struggle which goes on between the individual and the invading microörganisms, and when it exists should be carefully looked after.

Implantation of tuberculosis through milk and meat as articles of food must not be overlooked, although this is not a serious source of danger. That tuberculosis can be contracted by ingestion of meat and milk of tuberculous animals cannot be doubted; but universal clinical experience and laboratory experiments, such as those carried on by Schroeder, Cotton, and others, seem to indicate that the disease seldom arises in human beings in this way.

If we wish to block the way of infection in tuberculosis, (1) we will have to control the exit of the tubercle bacillus from hosts already infected. This means that every individual who has tuberculosis must be brought under observation and taught how to devitalize all tuberculous matter given off. (2) We must endeavor to sterilize all enclosures which have been infected with tuberculous matter, as well as those things which have been infected by reason of being within those enclosures or being used by persons who have tuberculosis. This is a herculean task, which cannot be accomplished immediately. Until it can be accomplished every effort should be made to have people ventilate their houses and to expose them as much as possible to fresh air and sunlight. (3) We must look after the children who are exposed to tuberculosis: (*a*) through

contact with those who have the disease; (*b*) through living in enclosures in which the disease has existed; and (*c*) through infected food. Such children should be placed under better environments, be given food which is sterile from tubercle bacilli, and be kept well nourished. Special supervision should be given to their upper air-passages and buccal cavities, and as far as possible these parts should be kept in a perfectly healthy condition.

A CASE OF KERATITIS DISCIFORMIS.[1]

BY C. A. VEASEY, M.D.,

Assistant Professor of Ophthalmology, Jefferson Medical College; Ophthalmic Surgeon, Methodist Episcopal Hospital.

The following notes illustrate that type of corneal disease known as keratitis disciformis, which was first described a few years ago:

M. A., a male Italian laborer, aged about 35 years, was first seen April 25, 1906, when he complained of soreness of the right eye. The inflammation began, according to his statement, three months before. He had no knowledge of any severe injury to the eye at the time the inflammation was first observed, but being a laborer was constantly exposed to flying dirt and small particles of stone, and recalls numerous occasions when these had to be removed from his eyes. The eye had been more or less irritated, without much secretion, for three months, and there was present an opaque spot which he desired to have removed.

The vision of O. D. was 20/100; of O. S., 20/20. The conjunctiva of O. D. was very slightly injected, and near the apex of the lower inner quadrant of the cornea was a small area of haziness about 3 millimeters in diameter. This hazy area was circular in shape, but the infiltration was beneath the epithelium, the latter being somewhat roughened, but not staining with fluorescein. With the corneal loupe the disk-like area of haziness resolved itself into a number of small grayish spots, the center and outer margin being exceedingly dense, but between the two there remained an area of less density, through which a red glare could be obtained from the fundus. The infiltration extended deeply into the substantia propria, and there was a distinct line of demarcation from the adjacent cornea, the latter being normal in appearance. The area was slightly anesthetic.

Under five months' treatment by massage the opacity apparently has grown somewhat smaller in diameter and certainly less dense, and vision has improved to 20/70. There remains, however, the disk-like area, well defined from the surrounding cornea, denser in the center and at the margin.

The case seems to be one of keratitis disciformis, probably produced by some injury to the cornea by a particle of dirt or stone, first described by Fuchs in 1901, and two cases of which have been exhibited before this section by Dr. William Campbell Posey. The question as to whether the disease is due to infection, and whether the infection is ectogenic or endogenic, is not finally determined, Fuchs inclining to the former and Von Hippel and Shirmer to the latter view. One case has been examined histologically by J. Miller, who inclines to the view that the disk-like area is always due to infection. On the other hand, Peters thinks the condition is due to a nervous lesion affect-

[1]Paper read and patient exhibited in the Section on Ophthalmology of the College of Physicians of Philadelphia, Oct. 16, 1906.

ing the corneal epithelium, and that no difference exists between it and herpetic corneal disease.

Treatment is of little avail and consists of mild cleansing lotions, atropine, and the usual ulcer treatment should the epithelium break down, as has been recorded in a few cases, and massage with yellow oxide ointment or other suitable substance.

1831 CHESTNUT STREET.

REPORT OF A CASE OF FULMINANT RETROBULBAR NEURITIS.[1]

BY C. A. VEASEY, M.D.,

Assistant Professor of Ophthalmology, Jefferson Medical College; Ophthalmic Surgeon, Methodist Episcopal Hospital.

The following case of acute retrobulbar neuritis is believed to be of a somewhat rare type and to possess some points of unusual interest:

C. M., a married male, aged 39 years, has been stockkeeper in a large toy store for seventeen years. On the whole his health has been excellent. He had the usual diseases of childhood, and ten years ago an attack of pneumonia, followed a little later by typhoid fever. Syphilitic infection is denied, and there is nothing to indicate that his statement is not true. His occupation requiring him to be indoors, he is but little exposed and has never had any symptoms of rheumatism. His vision has always been good. For two years he has used glasses of his own selection obtained from an optician. So far as could be ascertained there is no history of any ocular disease in his family.

On June 16 he was brought to the eye dispensary of the Methodist Episcopal Hospital totally blind. He stated that on the preceding day he had gone to his work at the usual time in the morning feeling perfectly well. During the morning his vision began to grow "foggy," and this fogginess became rapidly worse during the day. He left his work at five o'clock to go to his home, and when he got off the car near his house was so blind that he could not distinguish anything. He is positive in his assertion that although he made repeated trials he could not tell whether the gas was or was not lighted. The following day, as stated above, he was brought to the dispensary and was examined by Dr. J. B. Turner and Dr. Austin O'Malley, who found no lesions of the fundi, and admitted him to the hospital.

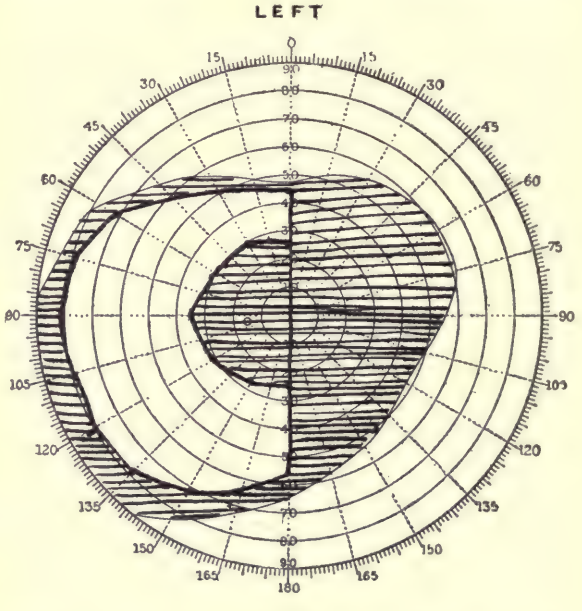

FIG. 1.—June 21. Absolute central scotoma. No color field.

When examined by myself he was entirely blind, both pupils widely dilated and not re-

[1]Paper read and patient exhibited in the Section on Ophthalmology of the College of Physicians of Philadelphia, Oct. 16, 1906.

acting to light. There were no changes whatever in the fundi, both nerves and all vessels appearing normal. With the exception of some deep-seated ocular pain in both eyes, most marked upon pressure, and the blindness, there were no other symptoms. There had not been any headache at any time, and excepting the alarm from the loss of vision the patient seemed in good health and spirits. He could not recall whether his vision disappeared first from the central field, from the periphery, or from one side.

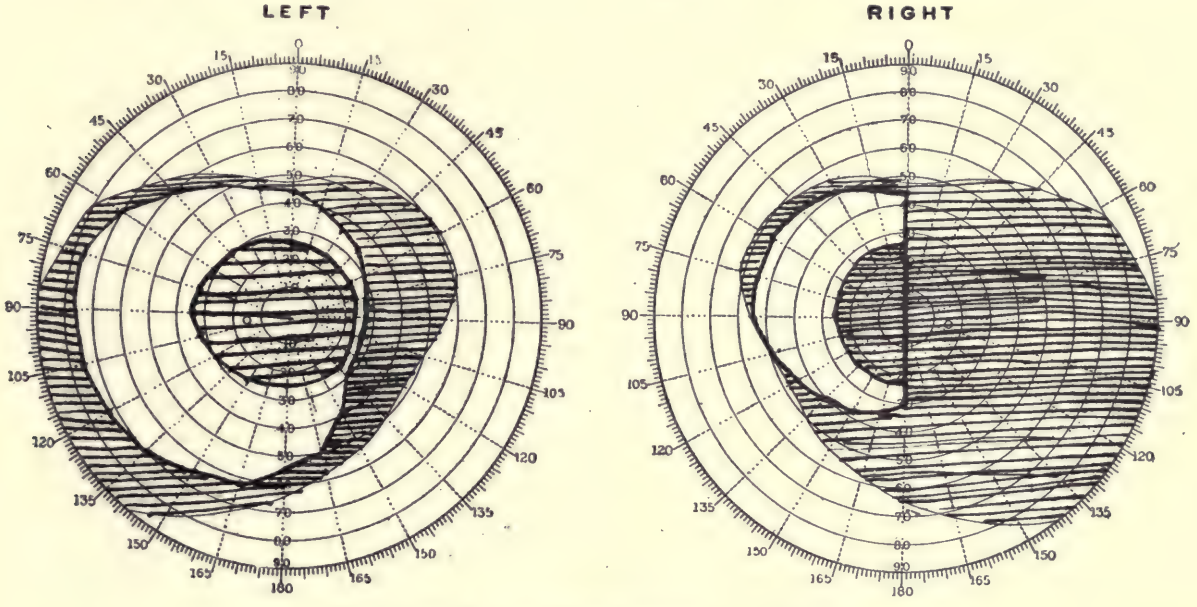

FIG. 2.—June 23. Absolute central scotoma. No color field.

The physical examination of the thorax and abdomen was negative. An examination of the blood showed it to be practically normal, but the urine contained a trace of albumin and a few hyaline casts. A neurological examination made by Dr. C. W. Burr did not throw any light upon the ocular condition, nor did an examination of the sinuses reveal anything abnormal. He had a few decayed teeth, which were extracted.

The patient was given absolute rest in bed, mercurial inunctions, full doses of salicylate of sodium, and copious sweats. Subsequently the salicylate was discontinued and iodide of sodium substituted.

On June 21, five days after admission or six days from the appearance of the blindness, the patient was able to count fingers at one foot in the temporal field of the left eye. The field of vision taken at this time shows the right, or nasal, half totally blind, but light and form perception reëstablished in the temporal half. There was a large central scotoma. On June 23, two days later, vision had returned in a portion of the nasal field of the left eye and in the nasal field of the right eye, the temporal half of the right eye still remaining blind. There was also a large central scotoma in this eye. Thus, considering the field of the right eye upon this date and of the left eye two days before, there was a condition resembling a right homonymous hemianopsia. On June 30 the visual field of each eye was restored, but vision was still much reduced, equaling only the counting of fingers at a few feet. On July 5 vision in O. D. was 1/24, in O. S. 1/3. The

albumin had disappeared from the urine, but a few narrow hyaline and finally granular casts were still present.

Until this date, July 5, three weeks from the appearance of the blindness, no ophthalmoscopic changes could be detected, but at this time the disks seemed to be somewhat paler than before. There was never any appreciable swelling of the nerve-heads nor alteration in the size of the retinal vessels. From this time

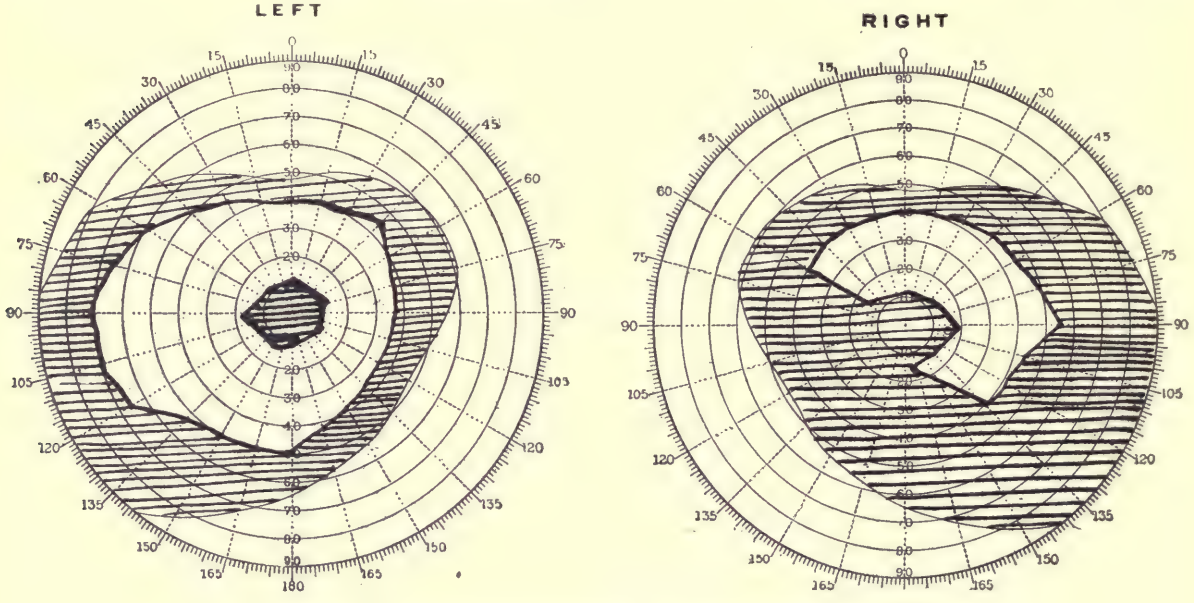

FIG. 3.—October 12. Relative central scotoma in left, absolute in right. No color field.

on the nerves became more and more pale in spite of full doses of strychnia internally and by hypodermic injection into the temples, nitroglycerin, galvanism, and the usual medication for optic nerve atrophy. At the present time his central vision is for O. D. 1/135, and for O. S. 1/2, and the fields as shown in the accompanying diagram, there being a relative central scotoma in one eye and an absolute scotoma in the other.

The case is believed to be one of an unusually severe attack of acute retrobulbar neuritis, as it is difficult to explain the symptoms on any other ground. Hemorrhage into the optic nerve sheaths has been considered, but it is hard to conceive of such hemorrhage occurring simultaneously on each side. A lesion of the corpora quadrigemina might produce the blindness, but it is most unlikely that such is the case as there were no other symptoms. Inasmuch as the patient had handled toys, many of which were painted, for so many years, the possibility of lead poisoning was thought of, but no trace of lead could be detected in the urine, nor were there any other symptoms to point to such a condition.

The case is of unusual interest, because of the rapidity with which vision was lost, because of the lack of fundus changes until the atrophic process was noted, because both eyes were affected, and because of the hemianopic defect of the visual fields, which was observed as vision was returning.

I am greatly indebted to Dr. Austin O'Malley for his assistance in studying the case by his many chemical and microscopical examinations.

1831 CHESTNUT STREET.

PARALYSIS AGITANS WITHOUT TREMOR.[1]

BY AUGUSTUS A. ESHNER, M.D., PHILADELPHIA.

So-called pathognomonic signs and symptoms cannot be infallibly depended upon. While on the one hand such undue importance should not be attached to any one manifestation of disease as to exclude a proper consideration of all of the other features of a case, no phenomenon is so insignificant that the clinician can afford to ignore it.

Names of diseases based on clinical manifestations are found at times to be inadequate by reason of the occasional absence of one or another distinguishing characteristic. Thus, exophthalmic goitre may in one case be unattended with protrusion of the eyeballs and in another case without enlargement of the thyroid gland. Paralysis agitans is not a true palsy, and rarely even the tremor is absent. When the tremor is present, however, it is usually so distinctive as to be almost unmistakable. It consists in a rhythmic, relatively slow and coarse movement, repeated between five and six times in the second, taking place almost invariably during rest, and usually being inhibited, at least temporarily, by voluntary action and also by passive movement, as well as by an effort of the will and by a psychic motor impulse. It is generally increased by observation and emotional influences, and it is said to be absent during sleep. Rarely it has been wanting or but slight during rest, and induced or increased by voluntary action. Sometimes the tremor is so little marked as almost to escape observation, but even then the diagnosis can at times be made from the peculiar facies, the stolidity of countenance, the stooping attitude, the rigidity of posture, the slowness of movement and of speech. I have previously placed on record two cases of this character,[1] and I desire now to report a third in which the diagnosis of paralysis agitans was made from the general aspect of the patient in the absence of tremor.

S. R., a weaver, 61 years old, presented himself on account of cough, weakness, and nervousness. The nervousness was said to have followed upon the appearance of sores on the left leg, although previously the patient had suffered considerable anxiety on account of the illness of his wife and son. The countenance presented a fixed appearance, while the shoulders were stooped forward and there was a tendency to propulsion. There was some want of mobility in the left upper extremity as compared with the right, and in walking the left arm was swung less freely than the right, and the left foot was scraped on the floor. It was stated that the man perspired freely.

I concluded that the case was one of paralysis agitans, although no tremor was apparent at this time. At a subsequent observation, however, slight tremor was appreciable in the thumb of the left hand suggestive of the pill-rolling movement, and when the patient rested his left hand on a table intrinsic tremor was visible in some of the muscles of this member. The knee-jerks were quick and increased, in greater degree on the left. The action of the heart was rhythmic; the first sound was clear, the second valvular. The urine was free from albumin and sugar. There was nothing noteworthy in the family history or in the patient's past personal history.

In all three of the cases it will be noted that the tremor was not at all times absent, and I am rather inclined to believe that in these, as well in others like them that have found their

[1]Read before the Philadelphia County Medical Society, Oct. 24, 1906.

[1]*Journal of the American Medical Association*, Feb. 16, 1901, p. 422.

way into the literature, the apparent or temporary absence of the tremor is due to restraint through muscular rigidity.

Paralysis agitans occurs most commonly in the middle and early late period of life, although occasionally cases are observed in the fourth decade and earlier. Physical and psychic shock are the most important etiologic factors. The morbid anatomy of the disease has not yet been definitely established. The histological alterations most commonly found consist of an increase in the neuroglia tissue, and pigmentary and degenerative changes in the motor cells, with or without arteriosclerosis, and not confined to any special portion of the central nervous system. Accordingly the malady is essentially incurable, although at times great amelioration of the symptoms may be brought about. Preparations of hyoscyamus have proved most serviceable in this connection.

The tremor may hypothetically be attributed to interruption of motor impulses responsible for muscular tone in consequence of interference by the neurogliar hyperplasia with the transmission of nerve force. The subsidence of the tremor on voluntary effort is in turn due to the amplification of the tonic motor impulses necessary for the execution of a given movement. Restraint of the tremor by passive movement must be considered as reflex. The cessation of the tremor under these conditions is at best only temporary and persists for only a brief time.

THE ROLE OF ORGANIC PHOSPHORUS IN THE TREATMENT OF ASTHENIC CONDITIONS IN VARIOUS NERVOUS DISEASES.

BY ALFRED GORDON, M.D., PHILADELPHIA,

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Asthenia is a symptom which is characterized essentially by "a deficient resistance of the organism to morbid influences" in the motor as well as in the psychic spheres. The want of motor energy, the disturbance of the dynamic state, are the main features of this condition. Asthenia may be localized or generalized. The latter form may be so pronounced that the will is unable to overcome it; it may also be slight and relative. An asthenic state may follow or accompany infectious diseases, intoxications, also visceral diseases, finally nervous diseases.

Diseases of the nervous system, whether organic or functional, very frequently present during their evolution a general asthenic condition which it is important to recognize. The intimate nature of asthenia as well as its pathogenesis is as yet difficult to determine. The study of its causes shows that the symptom in question may have various origins. That the central nervous system and the cerebellum play a certain rôle is undeniable. The accompanying vasomotor and secretory disturbances plead in favor of a sympathetic origin. These facts, however, are not sufficient. Our knowledge concerning internal secretions of ductless glands, our constantly increasing knowledge in the domain of metabolic processes, present more definite propositions for the problem in question. It is to biological chemistry and experimental physiology that we must address ourselves for an explanation of obscure phenomena.

The relation of phosphorus to asthenia is a problem of great importance. The rôle of this mineral in the animal economy is considerable.

Biological chemistry and experimental physiology have within the last few years advanced so far as to explain physiological phenomena heretofore obscure. Among its various problems that of the rôle of phosphorus in the animal economy should be emphasized. That each cell, tissue, and organ of animal or vegetable origin contain large quantities of phosphorus is well known. In amphibia, fishes, and birds the amount of phosphorus is large and sufficient for the development of the embryo. In mammifera the quantity of phosphorus in the fertilized ovum is very small, but the embryo gets from the mother all the phosphorus necessary for its development.

According to Voit (Hermann's Handbuch der Physiol., t. vi, 1881, p. 80) the average amount of phosphoric acid contained in various tissues of an adult body is 1600 grammes, of which the largest quantity is taken up by the bones, 1400 grammes, 130 grammes by the muscular tissue, and 12 grammes by the nervous tissue. The remaining portion is taken up by other organs in the following order: liver 10.5, lungs 5.5, blood 4.0, spleen 2.0, and kidney 0.3. To keep up the average amount of phosphorus the organism cannot depend upon itself as it does not elaborate it, but upon the supply of consumed food. The function of the alimentary phosphorus is therefore to assist in the growth of the organism and to substitute the normal daily loss of phosphorus. Forster (*Z. f. Biologie,* t. ix, p. 297) fed dogs with meat deprived artificially of the soluble saline substances rich in phosphorus. The animals lost large quantities of their own phosphorus, reached a state of extreme exhaustion, and refused nourishment. Forster thinks that by this procedure animals die more rapidly than by ordinary starvation.

For a long time especially under the influence of Liebig's investigations phosphorus was thought to exist in the animal tissue in inorganic combinations. The discoveries of Gobley in 1846 and Liebreich in 1865, also the remarkable studies of Thudichum (Die chemische Konstitution des Gehirnes des Menschen und der Thiere, 1901), have shown the existence in the brain and nervous tissue of organic combinations of phosphorus. Lecithin, protagon, cerebrin, are all well-known phosphorus compounds in the nervous system belonging to the glycerophosphoric group. Among other organic combinations of phosphorous found in other tissues the nuclein group, which was discovered by Miescher in 1869, deserves special mention.

We know now that the largest portion of phosphorus in the tissues is in organic combination. On the other hand, the elimination of phosphorus in the urine and feces is almost exclusively inorganic. It may be concluded that the decomposition of the organic combinations of phosphorus takes place in the tissues, and that the mineral phosphates of urine present the last step and the final product of the phosphoric metabolism. Weyl, Zeitler (*Z. f. physiol. Ch.,* t. vi, p. 557), and Macleod (*ibid.,* t. xxviii, p. 535) have proven it experimentally.

Among all the tissues of the organism the nervous system plays the most important rôle in the process of decomposition of phosphorus. The opinion of the majority of investigators is that prolonged mental activity or physiological excitement of the nervous system (for example, sexual intercourse) is accompanied by a large elimination of phosphoric acid. Also in diseases of the nervous system, in insanities with exaltation, the amount of excreted inorganic phosphorus is augmented (Zuelzer: *Virchow's Arch.,* t. lxvi). In view of these special characteristics of the nervous system it is easy to conceive the necessity for the organism to reform the organic phosphoric combinations and give them to those tissues which suffer most under special conditions, as

for example in certain nervous diseases. *A priori* we can say that certain exhaustive disorders of the nervous system should be treated not only with the usual drugs appropriate for each individual case, but also by phosphorus in organic combinations, as only the latter can build up tissues and restore the daily loss of phosphorus.

As to alimentary organic phosphorus we know that among the nutritious substances of animal origin milk and yolk of eggs contain nuclein; meat and brains contain principally lecithin. In the vegetable kingdom cereals, peas, beans, carrots, and potatoes are very nutritious by virtue of their organic combinations of phosphorus.

A question arises: If phosphorus is present in food in a state of organic compounds, has the mineral phosphorus its *raison d'être* in therapeutics? Instead of entering into a detailed discussion of the subject, it is sufficient to call attention to the conclusions of at least some authoritative observers, as Bókai (*Z. f. phys. Ch.,* t. i, p. 157), Hasebrock (*ibid.,* t. xii, p. 148), Stassano and Billon (*Compt. rend. Soc. Biol.,* 1903, p. 482), Sandmeyer (*Z. f. phys. Ch.,* t. xxi, p. 87), Popoff (*ibid.,* t. xviii, p. 533), who made exhaustive experimental studies of this interesting question. They all agree that it is not phosphoric acid but the organic combinations of phosphorus which are absorbed and utilized by the organism, and that the mineral phosphates will not replace organic phosphorus, in which the animal and vegetable food is rich. These facts of physiological chemistry appear to me of great interest and importance from a therapeutic standpoint. Long ago my attention was attracted by that general lowering of various functions observed in individuals suffering from protracted organic and functional nervous diseases. The observations that I am about to relate, although purely clinical, nevertheless corroborate the experimental side of the question taken up by the authors cited.

Among quite a large number of nervous cases observed mainly in hospitals and partly in private practice I had a good opportunity to make a close and uninterrupted clinical study from a therapeutic standpoint only of 56 cases; I was able to follow up the cases for a long period and observe the comparative value of drugs other than organic phosphoric combinations, other things being equal. The majority of the cases (28) were multiple syphilitic affections of the nervous system. The remaining are distributed as follows: 5 cases of tabes, 14 neurasthenics, 2 cases of melancholia without delusions, 3 cases of obsessions, 4 of cerebral softening. The treatment was aimed exclusively to combat the pronounced asthenic condition from which the 56 cases were suffering. As the specific cases showed more asthenia than the rest, it is on the former that the effect of my medication was most pronounced. The sense of exhaustion caused by the affections themselves was unequally present in all of them. Of course I need not dwell upon the administration of other drugs proper in each individual group, as for example mercurials and iodides in the specific or in the tabetic cases. Massage and electricity were administered in some cases. Other drugs were employed to combat various morbid manifestations, as for example insomnia, anorexia, or constipation. As the cases were selected for the purpose of testing the effect of phosphorus upon the asthenia in the course of nervous diseases, it was important to study that effect independently of other treatments. With this object in view phosphorus was uniformly administered to all of them in conjunction with and without other drugs. I hasten to say that while, for example, mercurials and iodides improved for a certain time the symptoms of the diseases, they failed to remove or improve the

asthenic condition. Phosphorus added to the other treatment showed a most beneficial effect upon the accompanying asthenia; the special symptoms of the disease itself were apparently also ameliorated. The latter were particularly observed in the cases of a cerebrospinal syphilis. I wish to be understood that I do not attribute to phosphorus the property of ameliorating syphilitic infiltrations in the meninges or in the nervous tissue. I merely put on record this clinical fact, that phosphorus so to speak *reënforced* the well-known effect of mercurials and iodides. It is interesting to note that when for the purpose of study the phosphoric treatment was withdrawn, not only the general asthenia returned, but the symptomatic treatment was far less effective than formerly.

The amelioration of the asthenia in all my cases progressed uninterruptedly, as long as the phosphates were given. My organic nervous cases being *per se* affections of grave nature and of long duration, the treatment in question has been kept up for an indefinite time.

The functional cases present a different condition. Out of the 14 neurasthenics 8 were post-grippal. As is well known, among the sequelæ of influenza a protracted asthenic state is quite common. In these cases the favorable effect of the phosphates was unusually pronounced. As all the patients recovered, the time of administration of the drug was limited. In the other six cases the neurasthenia was the result partly of overwork and partly of great emotional shocks. Here again phosphorus was indispensable and practically the only drug that could be relied upon, as tests were made with strychnia, iron, arsenic, and others. Partial or complete "rest cures" were also instituted in the neurasthenic cases; the improvement and prompt amelioration began to show only when phosphorus began to be administered. The same remarks can be made about the three cases of obsessions, the two cases of melancholia, and the four cases of cerebral softening.

As to the question of the relative value of various organic combinations of phosphorus, the glycerophosphates appear to give the best results. Lecithin and protonuclein are the other products advised. Horbaezewski (*Allg. Wien. Med. Ztg.*, 1892) and Germain Sée (*Bull. de l'Acad. d. Méd.*, 9 Mai, 1893) have shown that nuclein produces a leucocytosis and consequently phagocytosis, but the action of its principles is as yet obscure. Gilbert's and Pasternak's most recent experiments on lecithin do not justify the large use of this phosphoric product, contrary to the opinion of Hoppe-Seyler, who sees in lecithin a great restorer of exhausted nervous tissue, and of Fürst (*Therap. Monatsh.*, August, 1903), who sees in lecithin almost the only valuable drug for cerebral exhaustion. In his well-known work on the glycerophosphates Robin (*Bull. de l'Acad. d. Méd.*, 9 Mai, 1893) writes: "They facilitate the assimilation of alimentary phosphates by the nervous tissue, they moderate the waste of nervous system, aid the restoration of the latter as they are utilized in their *entirety* by the organism." Prompted by the remarks of such a close and authoritative observer I used the glycerophosphates uniformly in all my cases. The results obtained as described above showed an increase in weight, improvement in strength and mental activity, a sensation of general "well-being." It can be therefore safely said that the administration of organic phosphorus compounds has for immediate consequence their rapid and complete assimilation, building up, and restitution of tissues; they therefore act as a regenerator and stimulant to the normal nutrition and metabolism of cells.

SOME FORMS OF KLEPTOMANIAS THE RESULT OF FETISHISTIC IMPULSES.

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According to Kraeplin morbid impulses are episodal symptoms of degeneracy. This statement may hang on to the border-line of clinical facts, but I do not think it includes all morbid impulses.

A morbid impulse differs from a compulsive impulse in that the former is executed rapidly without effort toward resistance, and is regarded as the natural expression of desire at that moment. Uncontrollable impulses having motivation are not accompanied with the mental cloudiness which generally exists temporarily in compulsive acts. The latter state is one of psychic epileptic equivalent. When we have a case of impulsive stealing of useless and trivial articles without apparent motive, it is reasonable to consider the case as one of moral or psychic degeneration, but in certain cases what appears to be the stealing of useless and trivial articles will be found to be an act having a purposive basis, an objective reason.

Strictly speaking these cases are not those of kleptomania, although generally so considered, for the object is secretly appropriated for a specific reason.

This latter phase of the subject has not been given the attention it deserves, and for the best of reasons. Few lawyers and not many medical men realize the polymorphic forms of sexual deviations, conditions that differ from pathological sexual perversions in that the individuals suffering from these deviations are otherwise normal, and in the proper environments and under proper conditions become sexually normal.

A case that came under my observation a few weeks ago will illustrate my meaning.

L. was a young woman of twenty-seven years of age. She was of good birth and excellent history, and up to the time mentioned had had undifferentiated sexual feelings. At a famous and fashionable summer resort she met a man who was very attentive to her in a gentlemanly and upright manner. It was a mere summer flirtation, and without anything more than guarded embraces. The first evening she met the man he unconsciously displayed a portion of the garter that held up his silk hose. At the time L. simply noted the carelessness of the act, but had no other feelings in the matter.

Upon her return to her home there began for the first time in her life distinct, clear, and culminative erotic dreams. These commenced by the subconscious visualizing of the blue garter. This vital vision led up to what ought to be seen in a healthy, virile man. The association of the garter with the night reveries increased to day ideation, but these latter were unsatisfactory, as no tangible picture of the man who wore the garter could be fixed sufficiently to bring about sexual ecstacy.

One day L. went into a shop to get a little present for her summer friend, and on the counter saw an exact duplicate of her fetish. It was instantly appropriated, and the young woman went immediately to her bedroom, where she gave way to the effect the fetish had upon her. From fondling the article to manustupration was a short road, and soon she found herself the victim of fetishistic masturbation. This was never practiced without the psychical aid of the garter, and to have the act culminate satisfactorily she must have a new garter each time. Another interesting point is that the fetish must be obtained unseen, surreptitiously, as all of her autoerotic acts

were based on clandestine meetings with her ideal. A garter purchased by her would have no effect upon her sexual centers.

Finally the young woman was detected in secreting the object of her desire, and upon investigation the family found a large collection of these "useless and trivial articles."

Her acts were pronounced symptoms of a marked case of kleptomania. The woman kept her secret well, knew exactly how she would be considered if the truth were known, and realized that her acts were nothing but deliberate stealing. She understood clearly that there was no impulse to steal for the pleasure of stealing, but that it was done in a manner, and for an article, that gave her sexual gratification, but not the gratification she ardently desired, for had she been able to have the substance instead of the shadow she would not have had the desire to steal the garters.

Kleptomania, or the morbid impulse to steal and appropriate articles of no value or use to the thief, undoubtedly exists as an entity in certain psychical states, and also in compulsive states with an epileptic factor. Kleptomania has, however, never been considered as having any objective cause for its existence. The disease has always been considered motiveless, and the act supposed to be perpetrated against the normal will of the individual. When there is a motive to steal, or in other words, when the articles are taken for a specific purpose or act, the act ceases to be strictly one of kleptomania and is of a criminal nature, yet we see by the above case that we may have a condition between the two where responsibility depends upon the power of the impulse over that of the inhibiting forces. As a rule in these sexual deviates the impulse is all-powerful and the inhibitory forces for the moment paralyzed.

The case quoted I should consider one of physiological fetishism, paradoxical as the term may at first appear. It was a case of physiological fetishism for the reason that the garter had a direct bearing on the normal sexual desires and acts. L. associated the garter with the man; its appearance visualized the male by whom she was sexually attracted, and the garter he wore had no effect simply as an article of wearing apparel, as would be the case in pathological, erotic fetishism, but only as bringing to her bodily presence the man himself.

In most cases pathological fetishism, as Krafft-Ebing remarks, is connected through gradual transitions with physiological fetishism, so that—at least in body fetishism—it is almost impossible to sharply define the beginning of the perversion.

Physiologic fetishism does not really extend beyond the limit of things which normally stimulate the sexual instinct. Fetishism is only pathological when the normal sexual stimulating portions of the body have no effect upon the opposite sex.

Even body fetishism, such as desire on seeing certain parts of the body, the hair, or detecting certain human odors, is not to be regarded as a *monstrum per excessum,* like the sadist or masochist, but rather as a *monstrum per defectum.*

Is it not possible that many of the so-called cases of kleptomania are really of a fetishistic nature; that underlying the impulse to steal there is a subconscious sexual element dimly recognized by the victim?

When we consider that the majority of the kleptomaniacs are either at the pubertal or menopause period, it seems to me to be worth while considering a sexual deviation as one of the motive factors in these puzzling cases.

CHLOROSIS AND ITS TREATMENT.

BY GEORGE F. BUTLER, M.D.,

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Chlorosis is an expression of many constitutional conditions. In some instances it is a symptom or serious complication rather than a disease by itself, although it needs treatment as well as the disease which it complicates and aggravates. It is far from exceptional to find it associated with the degenerative constitutions with all their expressions, including, as Virchow has pointed out, the arrested development of the circulatory, hematogenous, and reproductive organs. It is too often forgotten in this connection that the child is not an undeveloped man, but that the man is an imperfectly developed child. The child, as Havelock Ellis remarks, with its relatively enormous head, its large, protuberant abdomen, its small chest, short, feeble legs, comparatively vigorous arms, smooth, almost hairless skin, large liver, kidneys, thymus, and adrenals, presents a distinct anatomic picture from the adult. The differences are such as imply a greater blood-making, as well as greater eliminative, power. The liver, which is practically two organs, from its origin in the embryo, exerts from the beginning, as Minot has shown, a sanguifactive and a poison-destroying function. As it appears before the heart, it obviously plays a rôle in the proper development of the circulatory system. It is not astonishing therefore to find, as Sir Andrew Clark has pointed out, that stercoremia plays a large part in the development of chlorosis. The fact that chlorosis is most frequent in women does not militate against this opinion of Clark, as Osler[1] seems to think. Women are most apt to be affected by stercoremia, since in them circulatory perturbations are most frequent, in consequence of menstrual phenomena, and they are also most affected by autointoxications.

W. A. Hammond[2] believes chlorosis to be a disease of the nervous system, and when morbid changes take place in the blood, during its continuance they are always secondary and directly the consequences of nervous derangement, and therefore they are nothing more than accompaniments of the chlorotic condition. Chlorosis frequently runs its course without symptoms of pathologic change in the blood being manifested. Luzet[3] has said that hysteria and chlorosis are sisters. Stieda[4] claims that in chlorosis there are signs of general ill development, and that in particular there is imperfect development of the breasts and genitalia with a tendency to contracted pelvis. According to Lloyd Jones[5] chlorosis is but an exaggeration of a condition normal at puberty, and in many women at each menstrual period. In his opinion chlorosis is the extreme pathologic element in preparation for motherhood. The elements entering into the preparation for motherhood involve both increased need of extra nutriment and decreased elimination. The hepatic and renal functions are taxed coincident with the increased hematogenic demand. The conditions thus produced resemble those found in cyanosis, arising from toxic products resorbed from the intestine. Here Vander den Berg and Grutterink have found two sets of changes in the blood—sulphohemoglobin and methemoglobin. These changes are due to reduction of hemoglobin by nitrates. Chlorosis, despite the opin-

[1] Practice of Medicine.

[2] *Journal of Psychologic Medicine*, vol. ii.
[3] Havelock Ellis: Psychology of Sex, vol. ii.
[4] *Zeitschrift für Geburts. und Gyne.*, 1895.
[5] Trans. Internat. Med. Congress, 1897.

ion of Osler, sometimes, although infrequently, occurs among males. This fact was obvious even in the time of Shakespeare, who makes Falstaff remark (Henry IV., Part II, Act IV, Sc. 3): "There is never any of these demure boys come to any proof; for thin drink doth so over-cool their blood, and making many fish meals that they fall into a kind of male green-sickness." In Antony and Cleopatra he remarks: "Lepidus, since Pompey's feast as Menas says is troubled with the green-sickness." Observations of the preadolescent stage of hebephrenia indicate that a by no means small proportion of neuropathic boys are, like neuropathic girls, troubled with chlorosis. The chlorotic state of pretuberculosis is free from sex limitation. While this condition differs somewhat from pure chlorosis it resembles it in many of its features.

The following leading symptoms, according to A. Sokolowski, demand consideration: The pale aspect of the skin is one of the most important symptoms, since it misleads acquaintances, and not infrequently leads the physician to the erroneous diagnosis of chlorosis. This pallor, however, is often, but not always, distinguishable from that of chlorosis. In aggravated cases of chlorosis this paleness assumes a waxen hue shading into greenish, while in the milder cases all gradations of this color are exhibited. On the other hand, the skin in pseudo-chlorosis has a bluish-gray, shading sometimes into an ashen hue. The same may be said of the mucous membranes. The gums and mucous lining of the cheeks never exhibit such a high degree of pallor in pseudo-chlorosis as is almost typically characteristic of ordinary chlorosis. General lassitude, dyspnea on ascending stairs, and frequent palpitation of the heart are some of the most common and constant concomitants of the more advanced stages of ordinary chlorosis. Some subjective symptoms of pseudo-chlorosis appear at an earlier date and are of less intensity. Chlorotic persons are easily fatigued, especially when extra physical exertion is demanded, such as in climbing stairs; girls, however, affected with pseudo-chlorosis become fatigued upon the slightest exertion, while dyspnea may supervene during perfect quiet. Digestive disorders are constantly met with in both. A most constant symptom in pseudo-chlorosis is persistent lack of appetite lasting for weeks or even months. This also happens in true chlorosis. Here perverted appetite more often exists, the loss of appetite giving way to bulimia, an unreasonable desire for unusual food, which rarely occurs in pseudo-chlorosis. Among other examples of deranged digestion in both is obstinate constipation. Vomiting is rare and usually ascribable to spells of severe dry-coughing.

Emaciation is the most constant typical phenomenon of pseudo-chlorosis. This is progressive and constitutes an important diagnostic mark from true chlorosis, the patients afflicted with the latter trouble often losing little or nothing in weight, in spite of their disordered digestion. Menstrual disorders are symptoms of pseudo-chlorosis. As a rule the catamenia are scanty and pale in color, and become entirely suppressed only when the symptoms of tuberculosis have become pronounced or are considerably advanced. In chlorosis, on the other hand, the menses are completed but seldom, while they may disappear entirely for a protracted period. With respect to the circulatory system, well-known murmurs of the heart and jugular veins make their appearance in the course of chlorosis. These may occur in pseudo-chlorosis, but they are very rare and not of the same intensity. A much more constant symptom in the course of pseudo-chlorosis is considerable acceleration of the pulse, attended by exacerbations toward evening of the fever, which appear in the earliest stages.

These varying attacks of fever, recurring every evening, sometimes last for months, and are frequently the cause of continually progressing emaciation. In every form of obstinate chlorosis it is of utmost importance to take the temperature, since the thermometer may throw light on the nature of the disease even in its earliest stages. Fever exceptionally accompanies true chlorosis. This is rare, however. Molliere in 1882 described it for the first time under the name of "chlorose-febrile." Hayem is hardly justified, however, in claiming that these fevers must be referred to certain complications not at all allied to chlorosis. The fever solely referable to pure chlorosis is almost continuous, but may occasionally be aggravated during the morning hours. The rises in temperature sometimes occur in pseudo-chlorosis during the earliest stages at a period when physical changes in the lungs are not demonstrable. After such changes have undoubtedly taken place the fever assumes a continuous hectic type. Cough generally constitutes a symptom of pseudo-chlorosis. In the beginning it is but light, short, and dry, and principally occurs during the evening, but it may make its appearance at night. In the same measure, however, as the disease progresses, the cough grows more constant, with sometimes in severe cases more or less bloody expectorations. Sokolowski has seen cases in which cough was completely absent, while the lobes were distinctly affected. Commonly the expectoration is absent, setting in only when the physical signs of parenchymatous induration become prominent. Then the tubercle bacilli and elastic fibers can be readily demonstrated. A short, dry cough frequently occurs in the progress of chlorosis, but principally during the daytime, never in the evening, much less at night. It not infrequently is a reflex symptom originating in the fauces or nose, from granulations, fauces hyperesthesia, muscle hypertrophy, etc., and is sometimes a neurotic mimicry of a real disorder.

In regard to the hematology of chlorosis Osler remarks: "The drop as expressed looks pale. Johann Duncan, in 1867, first called attention to the fact that the essential feature was not a great reduction in the number of the corpuscles, but a quantitative change in the hemoglobin. The corpuscles themselves look pale. In 63 consecutive cases examined at my clinic by Thayer, the average number per cubic millimeter of the red blood-corpuscles was 4,096,544, or over 80 per cent. There may, however, be well-marked actual anemia. The lowest blood-count in the series of cases referred to above was 1,932,000. There may be all the physical characteristics and symptoms of a profound anemia with the number of the blood-corpuscles nearly at the normal standard. Thus in one instance the globular richness was over 85 per cent, with the hemoglobin about 35. No other form of anemia presents this feature with the same constancy and in the same degree. The importance of the reduction of the hemoglobin depends upon the fact that it is the iron-containing elements of the blood, with which in respiration the oxygen enters into combination. This marked diminution in the iron has also been determined by chemical analysis of the blood. The microscopic characteristics of the blood are as follows: In severe cases the corpuscles may be extremely irregular in size and shape—poikilocytosis, which may occasionally be as marked as in some cases of pernicious anemia. The large forms of blood-cells are not as common, and the average size is stated to be below normal. The color of the corpuscles is noticeably pale, and the deficiency may be seen either in individual corpuscles or in the blood mixture prepared for counting. Nucleated red corpuscles are not very uncommon, and may vary greatly in

numbers in the same case at different periods. The leucocytes may show a slight increase; the average in the 63 cases above referred to was 8467 per cubic millimeter."

The criteria by which Sokolowski attempts to demarcate tubercular pseudo-chlorosis from chlorosis fail in the cases in which they are most needed. In hysterics there often occur a so-called nervous cough, rise of temperature, and even hemoptysis. Of course, the tubercle bacillus is pathognomonic evidence. The treatment of chlorosis, therefore, cannot be confined to the ordinary restorative therapy. The conditions of maldevelopment require something more than iron or manganese for their stimulation. The great results obtained by opotherapy in conditions of maldevelopment generally, and in arrested development through removal of physiologic organs, would indicate its employment here. The imperfect metabolism aggravated by hepatic and renal inadequacy would indicate the use of alteratives rather than of simple restoratives. Sir Andrew Clark[6] made an attempt to reach this element by the following procedure: "On first waking in the morning sip a quarter of a pint of cold water. On rising take a tepid sponge bath; dry quickly, and follow with a brisk toweling. Clothe warmly and loosely; see that there is no constriction of the body or of the limbs. Have four simple but liberal meals daily, arranged after this fashion: Breakfast, eight to nine—whole meal bread and butter, with one or two eggs, or some broiled fresh fish, or the wing of a cold chicken or pheasant, and toward the close of the meal half a pint of equal parts of milk and tea not infused longer than five minutes. Lunch or dinner, one to two—fresh, tenderly dressed meat, bread, potato, well-boiled green vegetables, and any sort of simple farinaceous pudding or cooked fruit, preferably apple; drink one glass of Burgundy alone or in half a tumblerful of water. Tea, from four to five—whole meal bread and butter, with a cup of equal parts of tea and milk. Dinner or supper, from seven to eight—this should resemble the midday meal, but should be less in quantity. Nothing is to be taken after this meal, nothing between meals, and nothing but what there is set down. Walk at least half an hour twice daily, and as much more as strength and convenience will permit. Retire to bed about ten, and repeat the sponging and toweling. See that the bedroom is cool and well ventilated. Lead a simple, regular, active, occupied, purposive life; and do not notice or distrust yourself." He uses the following mixture: Ferri sulphatis, gr. xxiv; magnes. sulph., ʒvij; acid. sulph. arom., ʒvj; tinct. zingiberis, ʒij; infus. gent. co. vel quassiæ, ʒvij. Fiat mist. Sig.: one-sixth part twice daily, about eleven and six. Occasionally this acid mixture produces sickness, dries the skin, and is otherwise ill borne. In such cases an alkaline cathartic mixture is prescribed: Ferri sulphat., gr. xxiv; sodii bicarbonat., ʒij; spts. chloroformi, ʒj; inf. quassiæ, ʒvij. Fiat mist. Sig.: one-sixth part twice daily, about eleven and six. Sometimes neither mixture agrees. Then he prescribes iron sulphate in pills with meals and a saline aperient on first waking in the morning. Under this treatment nine out of ten cases markedly improve within three months.

In like conditions Vander den Berg and Grutterink advise similar treatment. Where sulphohemoglobin is present they advise active purgation of a type tending to relieve the hydremia present. Here the hydragogue cathartics like elaterium, asclepias, etc., can be employed to advantage. Where methemoglobin is present strict milk diet is required; the condition will reappear when starchy vegetables like potatoes, old cabbage,

[6] *Lancet*, Dec. 24, 1887.

turnips, carrots, radishes, etc., are added to the diet. The distorted metabolism and under-elimination indicate the employment of alteratives like copper, arsenic, and gold. Copper, as J. G. Kiernan[7] remarks, "enjoyed among alchemic physicians high repute, for what were later called nervine alterative qualities, in epilepsy, chorea, and insanity, whereof Burton's Anatomy of Melancholy gives evidence." Its repute led Paracelsus to make it the basis of one of his metallic tinctures. From him Rademacher took the therapeutic indications and type of tincture employed by the eclectics today. The Paracelsian use of copper was never completely abandoned by regular physicians. The first two American Dispensatories of Redman Coxe (1810) and Thacher (1812) describe copper as an alterative tonic, useful in epilepsy, chorea, and other spasmodic states, especially those connected with debility. Later therapeutists sustained this old repute of copper. Phillips states that copper in small doses is a good nervine tonic. Copper, according to J. V. Shoemaker, has a very decided tonic effect on the nervous system, and his opinion is likewise that of Biddle, Hare, Lauder Brunton, Potter, Culbreth, Foster, myself, and others. According to Brunton, copper stimulates both the heart and the capillary circulation, and is a general nerve tonic. In the eighth and ninth decades of the nineteenth century copper began to assume a new place in periodic medical literature. Luton and Liegeois showed that copper was of value in chlorosis, anemia, cachectic states, and as a nervine alterative. In 1894 A. F. A. Price determined that, while slow in action on secondary symptoms, copper prevents the development of mucous patches and throat symptoms in syphilis. The first evidence of copper saturation of the system was a voracious appetite, followed by giddiness, vertigo, prostration, and other symptoms, described by Arlidge, Hogben, E. S. Talbot, H. N. Moyer, and others as marking occupational copper poisoning. As in the case of other alteratives Price found the best results from small doses frequently repeated. In cachectic states 1/1000 grain of copper sulphate once daily has proved of value. Price ten years later confirmed and extended these results, pointing out the value of establishing copper tolerance in the preparasyphilosis stage. As to the preparation to be employed, Redman Coxe, Thacher, and Price, while finding copper sulphate of value, point out that it has at times unexpected dangerous untoward effects when the point of saturation is reached. These, through the influence of copper on the vascular system, often take the direction of cardiac neuralgia and pseudoanginas. The double salts of copper in small doses exert a cardiac action similar to that of digitalin, strophanthin, helleborin, etc. H. A. Hare prefers copper arsenite. Under its use digestion and nutrition improve. It is superior to Fowler's solution in chorea and similar neuroses. Luton and Liegeois prefer a pill containing one-sixth grain neutral copper acetate and five-eighths grain crystalline sodium phosphate. For hypodermic use they employ a solution (freshly made) of copper phosphate (freshly prepared), one part to two and one-half parts each of glycerin and water. The specific tincture of copper of the eclectics, which is the old Paracelsian tincture robbed of its crudities, like it has been employed in chlorosis, syphilis, chorea, epilepsy, acute neuralgia, and nervous adynamic states, in three- to six-minim doses frequently repeated, until the evidences of saturation already pointed out appear. The therapeutic indications for copper, according to Rademacher, are a grayish complexion, sunken features; small, soft, wiry pulse; light-colored, very acid urine, and early

[7] MEDICINE, 1904.

nerve symptoms; hallucinations, convulsions, delirium, etc.—all indications of what the older clinicians called nervous adynamia, a precursory stage of neurasthenia.

Arsenic is another agent of similar alterative nervine type. It markedly stimulates in small doses the blood-making processes, and exerts a decided influence on the general tone and on renal and hepatic action. It can be very advantageously combined with copper, with gold, and with the bitter and ferruginous tonics. Strychnia is a valuable adjuvant. The bromide of gold and arsenic preparations have an excellent field as alteratives in chlorosis.

Another alterative, mercury, is sometimes of decided benefit in chlorosis even when there is no specific infection. Inunctions of a small amount of mercurial ointment once a day or every other day, or small doses of mercuric chloride, from 1/60 to 1/40 grain, are very beneficial in some cases. When iron alone is given it will be found quite often that the drug passes through the bowels and is ejected, or else it accumulates in the liver, in both cases failing to be utilized and assimilated into a living part of the vitalized organism. In this case it has been found that the addition of nuclein solution to the prescription in doses not exceeding a drachm daily, preferably administered by being dropped on the tongue, apparently causes the fixation of the iron in the blood and tissues; and the gain will far exceed that accruing from the use of either iron or nuclein alone. The administration of the arsenates of strychnine, quinine, and iron with nuclein will often produce excellent results. As the condition is essentially a hydremic toxemia, venesection would seem at times to be indicated. In the palmy days of this remedy, so illogically disused by the profession for popular cosmetic reasons, excellent results were obtained from venesection by eminent clinicians. About a quarter of a century ago Fordyce Barker revived it with decided success. The use of normal salt solution undoubtedly adds to its efficacy, as this alone could initiate alterative conditions. In connection with opotherapy the value of diphtheria antitoxin must be remembered. This has often initiated through its alterative action improvement in leukemic states of more gravity than chlorosis. Like all alteratives, and inclusive of organotherapy, its use should be accompanied by careful watchfulness of elimination. To the neglect of this precaution are due most of the failures and untoward effects of the therapy of chlorosis. It should not be forgotten in this connection that an improvement may be overcome by under-elimination. Excretion, as H. C. B. Alexander[8] has shown, does not imply elimination. The pale urine of nervous states is an indication of renal insufficiency, not a true renal elimination. Chlorotics are in the nature of things very apt to excrete without eliminating. Free elimination should be maintained through all the excretory channels, especially through the bowels and kidneys.

It is frequently advisable to give some intestinal antiseptic, the sulphocarbolates being perhaps as good as any. It will often be necessary also to give some cardiac tonic.

The hygienic treatment I advise, especially in well-marked cases, differs somewhat from that recommended by Sir Andrew Clark quoted above.

At the outset rest in bed in a well-ventilated room or on a couch in fresh air should be particularly enforced. In chlorosis the cardiac muscle undergoes fatty changes, and if the heart wall is to recover itself and perform its function normally afterward it must have as much rest as possible during the treatment. For some time the patient should not be allowed to rise before midday. As soon as some

[8] MEDICINE, 1904.

improvement in the blood condition is observable, and some return of healthy functional activity is apparent, a moderate amount of gentle out-of-door exercise may be permitted, and this should be gradually increased with each increasing gain in health and strength.

Rectify such disadvantages of the life of the patient as can be ascertained. Overpressure at school, unwholesome conditions of work or amusement, late hours, worry, any emotional strain or excitement, sexual aberrations, tight lacing, etc., are points to which the physician's attention will be directed.

There are certain non-medicinal measures which are very efficacious in the treatment of this disease.

Hydrotherapy is of the greatest value as an adjuvant to medicinal treatment. It cannot well be dispensed with.

Enteroptosis may be helped by a cold abdominal douche and by abdominal massage. Elimination of toxic waste matter may be facilitated by a warm bath, electric light bath, or sun-bath to beginning of perspiration, followed by short, cold applications by rubbing the patient with a mitten or coarse towel with water at about 60°, or by giving the patient a cold douche of from five to twenty seconds' duration at temperatures from 70° to 60°. The temperature should be lowered one degree daily and the pressure increased. This is a powerful circulatory stimulant and combative of autointoxication, as well as a powerful stimulant of vital resistance. Various general graduated cold procedures are invaluable.

For vasomotor spasm and visceral anemias such measures as the general Scotch douche, visceral douches, short percussion douches, alternate compress, etc., are very effective. Cold sponging over the spine and outside and inside of thighs increases elimination and stimulates circulation. Constipation may be relieved and peristaltic activity increased by drinking a glass of cold water, preferably carbonated water, before breakfast; small cold enema; fomentation over liver twice daily, followed by heating compress during interval; wet girdle at night; cold fan douche to abdomen; cold percussion douche to spine; abdominal massage.

General massage, properly given, is a valuable means of treating chlorotic patients who are unable to take active exercise. It acts by increasing the circulation of the blood, by strengthening the muscular system, as an eliminant of waste matter, as a stimulant to the digestive system, as a mild cathartic by increasing peristalsis, as a sedative to the nervous system, and as a sleep-producer.

Static and faradic electricity will aid in the treatment of these cases. Faradism to the chest will stimulate respiration, and oxygen inhalations will improve the quality of the blood.

Chlorotic patients should drink plenty of water. Under certain conditions water is a hematic. It washes away waste matter and paves the way for growth of new material. Chalybeate remedies may be rendered more effective by adding to them large draughts of water.

In conclusion I wish to emphasize the great importance of mental therapy in the management of these cases.

The physician should get his patient into a cheerful, hopeful frame of mind. The hopefulness and optimism of the physician do far more than cure feeble minds and faltering wills. They assist in the cure of every disease he encounters. Alteratives and tonics for the mind are often quite as important and efficacious as alteratives and tonics for the body. Get the patient out of her introspective moods. Cheerful companions, a change of place and scenery, a visit to some chalybeate springs, inspire the psychical impulses and form a great incentive

to those who are despondent and prone to worry to exert themselves, and so aid in their own recovery.

Tonics are both mental and material. Hope is a capital tonic. Depressing mental conditions often neutralize the best medical treatment. The prospect of recovery will often bring about satisfactory results almost in the absence of drugs, and certainly often helps out wonderfully a lame line of treatment. Mental tonics should always be combined with material tonics.

THE MACROSCOPIC AGGLUTINATION OF THE TYPHOID BACILLI AS A DIAGNOSTIC TEST FOR THE GENERAL PRACTITIONER.[1]

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The macroscopic agglutination reaction refers to the phenomena which result when typhoid bacilli, in a liquid suspension, are exposed to the action of typhoid immune serum, which has the property of clumping these organisms and causing a visible precipitation of the clumps thus formed. As is well known, the characteristic features of the microscopic or Gruber-Widal test are the arrest of motion and the formation of bacilli into clumps. The macroscopic reaction differs from this only in that it affords opportunity for the exposure of a greater number of bacilli to the action of the serum, and the consequent formation of clumps which are sufficiently large to be visible to the naked eye. The precipitation of these clumps in the test-tube is a third and even more characteristic phenomenon and constitutes an end reaction which is unmistakable.

The development of the technique of this test had its origin in an observation that in the mixture of the diluted blood and the bouillon culture in a test-tube, preparatory to a microscopic test, a clumping and precipitation of the organisms occurred. The same process was observed when bacilli from agar cultures were suspended in water or salt solution and mixed with serum. Further tests showed that bacilli killed with heat or various antiseptics reacted as well or even better than the live organisms, for the reason that with dead bacilli the clumps formed are permanent if the mixture is allowed to stand, and will reform in less time than before if they are broken up by shaking; whereas the live bacilli may multiply after a few hours and break up the clumps already formed, or by the turbidity produced obscure the reaction. The essential details concerned in the preparation of the emulsion herein recommended are the results of a long series of experiments dealing with various cultures of typhoid bacilli and the influence of different media upon their agglutinability. The experiments also concern the efficiency of the various antiseptics used for the killing and preservation of the bacilli, the turbidity of the emulsion, and the methods of collecting and diluting the blood used in the test.

The conclusions are not yet compiled in a manner suitable for publication, but will be presented in the near future. As a preliminary announcement I would state, however, that the emulsion which has proved most efficient is a suspension of agar cultures of highly agglutinable typhoid bacilli in a one-per-cent salt solution to which is added .6 per cent of formalin. The turbidity index which is representative of the number of organisms present corresponds

[1]Read before the Section on Medicine, Illinois State Medical Society, at Springfield, May 15 to 17, 1906.

to the opacity of a mixture of one part of tincture of benzoin in approximately 15,000 parts of water. In rapidity of agglutination and reliability of results this emulsion equals, and with many serums surpasses, the preparations now on the market, including the much-discussed Ficker "Typhus Diagnosticum," a secret preparation which has been favorably received in Europe.

For experimental purposes, when large quantities of serum are required, the best method of collecting the blood is by aseptic puncture of a vein in the arm with an aspirating syringe of 5 or 10 Cc. capacity. The blood obtained is placed in a test-tube and allowed to stand until the serum has separated. For clinical tests, however, a sufficient quantity of blood can be obtained by puncture of the lobe of the ear under aseptic precautions. The blood may be mixed directly with distilled water in the proportion of 1 to 15, or a drop may be placed on absorbent paper or on a glass slide and allowed to dry. The dried blood can be used any time subsequently by dissolving it in 15 drops of distilled water. This, when mixed with an equal quantity of emulsion, gives an ultimate dilution of blood of 1 to 30. When the fresh blood is mixed with the diluting fluid, it should be allowed to stand until the fibrin and the corpuscles have settled before mixing with the emulsion, or it may be added to the emulsion at once, but in this case a control tube should be made of the diluting fluid, as the precipitate formed by the undissolved fibrin and corpuscles might otherwise prove misleading.

The use of the serum, obtained by allowing the blood to coagulate, is better than the whole blood for experimental purposes, for the reason that in a given quantity of serum the amount of agglutinating material is greater than in the same amount of blood, and in low dilutions no interference by corpuscles and fibrin occurs, thereby making possible the easier recognition of slight or incomplete reactions.

It has been generally recommended, in text-books, that a dilution of blood is equal to one-half the same dilution of serum. The experiments upon which this report is based show that the difference is not as great as this, and attempts are now being made to establish a more correct coefficient or ratio. Until this is done, if a dilution of blood or of serum is used, the same should be stated, as computations of blood dilutions in serum values are obviously incorrect.

It must be emphasized that an arbitrary dilution of blood of 1 to 30 and of serum of 1 to 50 is of value only when the amount of agglutinin is small—in other words, early in the disease. When the agglutinins present are great in amount or when the blood possesses a high agglutinative value, as it does when the disease is at its height, greater dilutions must be used. The reason for this is not clear, and it is not the object of this paper to enter into the discussion of this point. It is sufficient to say that a serum of high value will not agglutinate an equal quantity of emulsion of typhoid bacilli in low dilution as 1 to 50, as well as in dilution of 1 to 100 or higher. For this reason several tests with different dilutions are recommended.

DETAILS OF TEST.

To 1 Cc. of the emulsion in a 4-Cc. test-tube there is added an equal quantity of distilled water containing a stated amount of blood or serum. The tube is then corked and inverted a few times to insure mixing of its contents. The first change observed in the mixture is an increased turbidity, due to the formation of minute flocculi or clumps. These increase in size, causing a transition from a finely granular to a coarsely granular appearance. As the flocculi become larger they become more and

more distinct, until they slowly settle to the bottom as a white precipitate, leaving the supernatant fluid clear. The above is a description of a typical complete reaction, but in cases in which the agglutinins are insufficient the reaction may not proceed beyond the formation of flocculi, or if precipitation does occur, the supernatant fluid remains slightly turbid. Such an incomplete reaction may be considered highly significant of the presence of agglutinins, but repeated tests should be made from day to day until a complete reaction occurs.

In numerous experiments it has been observed that slight continuous agitation serves to increase or hasten the formation of flocculi, but prevents the complete precipitation of the same. This fact suggests that placing the tubes in the pocket where they are convenient for observation really enhances the reaction. Complete precipitation can be obtained by allowing the tubes to stand for a short time.

The advantages of this reaction over the microscopic test are obvious. The latter necessitates the possession of a microscope, a fresh bouillon culture of typhoid bacilli, repeated observations, and a familiarity with a rather tedious technique. In this test the dilution and admixture of serum and emulsion can be done at the bedside, the tubes placed in the pocket, and observations made during leisure moments. In point of delicacy, most cases of typhoid fever will show formation of flocculi with the macroscopic almost as quickly as with the microscopic test, although early in the disease cases are met with in which the agglutinins of the blood are present in such small quantities that the clumps formed are recognizable only with the microscope.

It should be remembered that this reaction is not an absolute indication of the presence of typhoid fever, but is only an index to the presence of agglutinins in the blood, and the interpretation of its occurrence is subject to the same restrictions which apply to the microscopic reaction. Agglutinins may not be present in the blood of typhoid fever patients until late in the disease, and may persist for several years after recovery.

Infection with paratyphoid bacilli will also cause the formation of agglutinins acting on typhoid bacilli, and owing to the similarity of symptoms confusion of these two conditions is undoubtedly frequent, but until the advent of the antityphoid serum the differentiation is not of great importance from a therapeutic standpoint. A typhoid bacillus, highly agglutinable to typhoid immune serums, which does not agglutinate with some paratyphoid immune serum, has not yet been obtained, and until such can be found the use of a paratyphoid emulsion which may be prepared and used in the same manner as the typhoid emulsion is advised. Paratyphoid immune serums do not, as a rule, agglutinate typhoid bacilli in as high dilutions as paratyphoid bacilli, and if the dilutions are equal the agglutination takes place more rapidly with the paratyphoid emulsion. The ease with which the test may be performed and the opportunity thus afforded to confirm or strengthen the diagnosis of a disease, which is often confused with other conditions, should make it a part of the routine examination in all cases where typhoid is a suspected or even a possible condition. The macroscopic test with emulsions far less delicate than the one now perfected has been used at various times in the wards of the Cook County Hospital and proved satisfactory. It is to be expected that in the general employment of this test some new facts will be discovered which have not been met with in the experimental work or in its as yet limited clinical application, but considering the general principles upon which it is established there seems to be no reason why it should not be generally adopted as a simple, reliable diagnostic procedure.

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SPECIAL ARTICLES.

THE SOCIAL EVIL.

V. PROSTITUTION.

In what has gone before it has been shown that the sexual passion is so dominating in its influence upon the human, especially the masculine, character that its gratification forms one of the chief objects of existence.

The dictates of social and ethical requirements make sexual gratification allowable only under the condition of matrimony, and impose such responsibilities upon married life that the growing tendency is to postpone it and in many cases to avoid it. Fortunately sentiment and love combine to neutralize this evil! But deferred marriage retains in the community a large number of individuals of both sexes, with healthy appetites, susceptible to the stimulating influences acting and reacting upon them, who have no legitimate means of sexual gratification, and to them only two courses, continence or illicit indulgence, are open.

No doubt many men abstain from sexual indulgence until the legitimate opportunity is afforded. A greater number do not. It is unnatural to abstain. It is only those whose moral development and ethical cultivation enable them to appreciate their social and moral obligations that can be expected to repress their natural instinct. Fear of consequences, native modesty, and lack of opportunity safeguard a few. This leaves us with a majority of the great army of the unmarried—and not a few who are married—without scruples against indulgence, and ready and willing to "follow nature." Many of these are deterred by consciences, not strong enough to smother their passions, from enjoying frequent indulgence; some are fairly passive, simply taking up with such opportunities as come to hand; others are active and eager in the search of opportunity.

Naturally these introductory remarks, together with most which has developed in the foregoing papers, apply essentially to men. It has been explained that with occasional exceptions passivity is the part of women, and that this passivity results from their good fortune in possessing comparatively little sexual appetite. This being true, we have now to inquire into those conditions of feminine existence that predispose to sexual immorality.

The lamp of love shines in every heart, warming the affections and lighting the soul to its affinity. The same love that culminates in the marriage of the fortunate burns in the souls of others whose half-smothered passions occasionally flame into consuming fires and lead them into error. It is after all only a little formality, this matter of marriage, a couple of promises, a trifling fee, a matter of registration, and the indulgence that is denounced as destructive to body and soul and ruinous to social life, becomes commendable, legitimate, and approved by God and man.

It is only natural that where all the attractive forces are at work and the bond of sympathy strong, reason shall give way to passion and error prevail, but it is destructive to the best interests of society, which are only to be found in the permanent unions which marriage alone can secure.

This form of sexual error, founded upon sentiments often pure in themselves, has little place in the present investigation. The frequency with which it happens can never be determined; it results from circumstances that are largely unavoidable, and it is in many cases

the unexpected culmination of unintentional or thoughtless acts, and it not infrequently terminates in indescribable anguish and remorse to one or both participants. The women who surrender themselves through uncontrollable affection must not be branded as strumpets. They are good and pure, but are the victims of temporary or lasting affection. There is all the difference in the world between them and prostitutes. They fall through accident, and though morally hurt, readily convalesce and return to their normal environment, sadder but wiser. They yielded to the embraces of one lover upon whom they lavished an excess of sentiment; the thought of yielding to another would be inconceivable to them.

The prostitutes, on the contrary, throw themselves before any man, and are willing, for pay, to yield to any. Their behavior is entirely without sentiment and is merely a matter of business.

As without the vicious women, who make the way to illicit intercourse easy, the greater part of the social evil would cease, it is necessary for us to inquire what conditions can transform the modest woman with her feeble sexual instincts and passive disposition into an aggressive solicitor whose body is at the public service for a consideration.

At the extreme of virtue stands the girl of good social standing, carefully educated, with high moral standards and enough information to enable her to avoid the pitfalls into which ignorance may lead the innocent. To her the world is beautiful and good, and man an equal in nobility and purity. The social evil is an abstraction of which she knows but rumors and desires to know no more. With her force of character, native sense of intuition and discrimination, dignified bearing and modesty, it is inconceivable that she should fall a victim to misplaced affection. Let us praise God that in our country she almost never does so!

Suppose now one whose moral fiber is a little more lax, whose education is imperfect in the essentials to which attention was directed in a former chapter, whose bearing is less dignified, but whose affections are equally strong. Will she stand as firmly entrenched against evil as her sister? Not quite; and an occasional mistaken confidence or misplaced affection in a lover whose lack of self-control or whose damnable deceitfulness may be his fault results in a fall. Here with fear of consequences and an anguish of humiliation and remorse on one or both sides the matter may end, unless through the accident of pregnancy or other means it becomes known, when unforgiving society, exonerating the man whose passions may be beyond control, but never ought to be, condemns the girl to a future of sneering suspicion or social ostracism from which she may never be able to escape, and in which it may be impossible to exist.

Birth and circumstance have placed a large number of women in an environment which, while not in itself particularly injurious, is not calculated to bring about the desirable evolution of the moral sense. Little notice is taken of sexual indiscretions provided they are not shamefully conducted, and occasional lapses are attended with little damage to the social standing.

Lastly, we come to a small class of women bred to wickedness, who in childhood become acquainted with every kind of vice and sin, grow up in it, know little else, and to whom virtue is an abstraction rarely spoken about, and then with suspicion.

"Birds of a feather flock together." The members of these groups are bound together by their common sentiments, but the groups themselves are held apart by their varying ethical standards.

Consider the extremes: the virtuous woman looks down upon her antithesis with horror,

fear, and loathing; the antithesis looks up in questioning suspicion.

These differing points of view are fundamentally and scientifically important when we come to investigate the psychology of prostitution, for prostitutes are recruited from all classes of society, though naturally most commonly from the poorer classes, and particularly from those whose standards of morality are primarily faulty.

For all endings there must be a beginning, and in nearly all cases the prostitute when questioned refers the commencement of her downward course to her original seduction. This is, of course, the beginning, and she rightly attributes the whole trouble to it, for had she not fallen she could not have remained in the mire; but it does not explain why she did not rise again. It is the failure to do this that makes her a prostitute. Why does she continue in error? The statement was made in a former paragraph that many a good and virtuous woman by stress of circumstances lavishes an excess of affection upon a lover, who, unworthy of her, embraces the opportunity to do her injury, and that in such cases discovery is usually the beginning of trouble. If the matter can be kept secret the outraged sentiments and violated sanctity may fester in the one troubled breast concerned, but if through any means it becomes known a dreadful penalty awaits the victim, who is sometimes disowned by her family, shunned by her friends, cast out by her circle, and abandoned by her seducer. This ostracism thrusts her into a new environment, a lower social stratum in which her error is condoned as one common to women, and a new standing formed. This may be the extent of her descent, or a new factor that makes its appearance may in cases where the moral fiber is less secure contribute to the moral ruin. This is the difficulty of self-support. It is not easy to be virtuous and poor, and when necessity arises and opportunity offers temptations are difficult to overcome. In this lower stratum the scruples once the safeguard of virtue are not popular. Sentiment is against them, and when, having lost so much that is dear, life becomes an eternal grind to keep body and soul together—life that is cheerless and friendless at best—why not cast off the virtue that remains, and forgetting the past and neglecting the future accept what pleasures and compensations can be found for the moment? And should this course be adopted and the life of virtuous labor abandoned for one of luxurious ease, what incentive can be found for reform, where it must inevitably mean a change from idleness to laborious industry, from affluence to grinding poverty, from good comradeship to lonely isolation, and where such a virtuous endeavor, should it ever be attempted, would never under any circumstances enable the individual to reinstate herself in her original station? Life is viewed now from a new standpoint that changes all things. The men who once moved as paragons of strength and virtue in the circle of that upper life are in part found to have another and a bestial nature. It may be that association with some of them is again possible, though upon a new platform, and the discovery of their double lives and the memory of the seducer throw a sickly suspicion upon all men, and virtue for virtue's sake becomes a travesty of the imagination.

Here life is freed of artificial restraints, the inclinations alone are followed, support even to the plane of luxury comes easily and without effort. What possible incentive can there be to abandon such a life for that in which "virtue is its own reward," and where contumely, incessant effort to keep body and soul together, and the surrender of almost every enjoyment are inevitable?

Or, should one be born amid the surround-

ings of this class, what but prostitution can recommend itself as a calling meriting consideration?

The employment of women is a matter deserving the earnest consideration of social reformers, for it has direct bearing upon many of the complications that have to do with the social evil. It is comparatively easy for young women to find employment to-day. The invention and popularization of the writing machine and of the telephone have afforded opportunity for thousands to be employed away from home where only hundreds could be provided for a generation ago. This makes vast numbers of young women capable of partial or complete support, and introduces a new and important factor for consideration, for when the income from this vocation is large girls lose one of the chief incentives to marriage, the desire to be cared for. If a woman finds herself capable of self-support and able to provide her own enjoyments, she is apt to question the advisability of foregoing this pleasure and satisfaction to become the wife of one whose income may doubtfully provide for two, and in proportion to her own independence does she look with disfavor upon men of small means, who must form the greater number of her friends. Her time of marriage is therefore postponed, and her suitors swell the number of unsatisfied males.

If, on the other hand, her income be insufficient to supply her wants, and only the necessities of life can be provided, there may be a temptation, in case no opportunity for marriage arises, to eke out the income or secure pleasure through the surrender of virtue. Indeed, there are unscrupulous employers who expect nothing else than that their underpaid employees shall adopt this very course, and even recommend it to them. We have heard of one firm whose saleswomen were not only so advised, but were even congratulated upon their good fortune in securing positions that would bring an opportunity for it by placing them conspicuously before the public eye. This makes easy the road to prostitution, and the ease with which the steps of the downward path are taken is obvious. The life of sin is notoriously a pleasant one. The recompense in money is dazzlingly large. Ease and luxury, good comradeship, fine clothes, beautiful ornaments, are inevitably associated with it. How easy therefore must it become for one whose physical being adapts her to such a life to pass through the successive stages of temptation, the fall, the eking out of subsistence, and the final abandonment of all moral notions to luxurious ease.

All forms of employment by which young men and young women are brought into intimate daily association are dangerous to the morals of both, even though nothing happens and the girl is unconscious of the risk she runs.

Prostitution assumes its most serious aspects in large centers of population, and in cities with a disproportionately large male population, as in university and garrison towns, seats of government, etc., for the reason that in them large numbers of sexually perfect but unmarriageable males are congregated. In ordinary towns and smaller cities, fornication takes place by favor, the number of males and females being approximately equal, but this, as has already been observed, is more a matter of sentiment than of profit to those concerned.

Prostitutes are usually divided into those whose business is clandestine and those who are public. The former comprise the larger group and are difficult to investigate, impossible to regulate, and dangerous in their effects upon the public welfare.

This is easily understood if one considers the way in which their trade is plied. The public or professional prostitute has no other vocation. Her body is her stock in trade. To

make it acceptable is her greatest care. She is, therefore, cleanly and tidy, and adopts every means of increasing her natural attractiveness. She well knows that venereal infection will be her undoing, and exerts every precaution to avoid it. It is part of her trade, therefore, to maintain as perfect health as possible, and to exhibit a skin smooth and soft and without blemish.

On the other hand, the clandestine prostitute plies her trade anywhere, glad of an opportunity to gather in an occasional shekel. She thinks little of her person, usually does not expose it, is not initiated into the prevalence and danger of venereal diseases, knows of no precautions and takes none, and is the chief means by which venereal diseases are disseminated.

Public prostitution is comparatively open and above board, and easy to locate. Clandestine prostitution on the other hand is a most difficult problem, for the clandestine prostitutes are everywhere—on the streets, in the shops, behind the counters of the large stores, in the hotels and restaurants, in our kitchens, and in our nurseries. They belong to a class whose regard for virtue is slight, who having once been seduced are quite willing to be seduced again for a consideration, but whose remaining sense of propriety prevents them from abandoning themselves to vice. They are reclaimable. It is for them that philanthropic sociologists should plan their work. It is from them in the course of time that the public prostitutes will be recruited, if nothing—marriage is the usual fortunate factor that intervenes—happens to stop their downward course.

Prostitution is the social evil—a monster that seems to grow larger and larger as we uncover and study it, but which in reality is shrinking as the general improvement of society takes place.

VI. VENEREAL DISEASE.

Nature and society impose two terrible penalties upon those who depart from the paths of virtue, dealing them out with little reference to the individual case, and without any endeavor to make the punishment fit the crime. The first is venereal disease; the second, pregnancy.

Venereal disease is the great physical evil, pregnancy the great moral evil, of illicit sexual indulgence. Both are of incalculable evil to their unfortunate victims; both involve others in misfortune..

It is, however, manifestly unfair to treat venereal diseases as something apart from other infectious diseases, or to regard them as the just punishment of misconduct. It so happens that they are peculiar in their usual mode of dissemination, and therefore can be made texts from which to moralize, such moralizing perhaps having a beneficial effect in assisting those who are fortunate enough to be informed about them to avoid them. But the fear of infection as an inducement to morality is so largely offset by prophylactic measures by which it may be avoided, and improvement in the methods by which diseases are treated, that it becomes problematical whether much can be gained.

The causes of the social evil are found in the artificial and unnatural conditions of social life, and so long as they persist, it and its associated evils and accidents must also persist.

From the philosophical point of view it would seem that more actual good might be accomplished in the present state of society by methods aiming to free sexual indulgence from the risk of infection, than by efforts directed toward the moral conversion of the race. Both endeavors are undoubtedly laudable: the former appeals to the practical, the latter to the sentimental reformer.

We concede all of the arguments of the moral reformer. Venereal diseases are amazingly common. They are calamitous in their effects upon many of those affected. They are transmitted to others for an unknown length of time—sometimes long after a cure is supposed to have been effected. Among those to whom they are transmitted are many innocent persons. They may be hereditary. Upon the innocent their ravages add insult to injury. In their wake may follow all the physical ills in the encyclopedia, and the sufferings they occasion are both mental and physical.

But after all this is said, what good will be accomplished? We are told that men will become moral through fear of injury to their own bodies and through the fear of the damage they may do their wives and offspring; that women will demand a higher standard of morality among men, and that therefore the general standard of morality will be improved. In all of these propositions there is truth, and we believe that a sensible moral campaign conducted along these lines will aid in a work that has to be approached from so many and such varied standpoints. But in this kind of moralizing, and especially in its practical execution, care must be taken lest the harm done shall neutralize the good expected.

We admit that venereal diseases are startlingly prevalent, but we do not know how prevalent, nor do we know any method of arriving at a correct estimate of it. We do know that many escape them, and that many others who become affected suffer but little ill effect. We then find ourselves crying calamity where experience shows but doubtful danger, and the excess of our zeal is our undoing. See the effects of this kind of propaganda in other spheres. The anti-tobacco zealot solemnly assures us that tobacco is the cause of insanity, blindness, deafness, cancer, heart disease, dyspepsia, and many other ills, all of which may be true in a few cases, but nearly every man uses tobacco more or less, and experience shows that very few suffer in consequence.

The temperance advocate pictures asylums and jails full of the unfortunate victims of overindulgence in alcohol, points to the mental and moral wrecks afloat here and there, dilates upon the seductive nature of the poison, and teaches the child that there is no escape for those who depart from the principles of total abstinence, though the child himself sees that the number of those who abuse liquor and suffer in consequence is but a small fraction of those who use it. These exaggerations lessen the force of the argument, and the extremism and uncompromising behavior of the reformers lessen their influence and brand them as alarmists.

To succeed in any work of social reform is to avoid extremism and to begin where the most immediate good can be accomplished.

It is an elementary principle of law that it is not the severity but the certainty of punishment that produces the wholesome moral effect. It is hence inutile to insist upon the grave dangers of venereal disease, when a large number escape them altogether, or suffer very little in consequence of them.

The effort of the reformer should be directed toward making the danger of infection as remote as possible, and then in insisting that the treatment should be as radical as possible. The root of the matter is to be approached with but little promise of immediate good in other ways.

It is a plan of some modern reformers to excite interest in the subject of venereal diseases among women so that they will become alarmed at the danger they run in becoming wives, and will require a higher standard of morality among men. This sounds reasonable, but what will be the effect upon women when they are early taught that most men are degraded and many diseased? Will they be

more or less willing to marry? Certainly not more so, and if less so, the time of marriage is likely to be postponed, and the conditions of marriage more restricted, which will simply mean that one of the chief predisposing causes of the social evil will be intensified and the evil itself increased.

Let us make this campaign against venereal disease on a manly platform and leave out the women. God knows their sufferings and anxieties in this complicated social fabric of ours are great enough without adding to them! What we want to do is to ease their burdens by avoiding that which may add to them. Let us do it alone.

VII. CRIMINAL ABORTION.

If there is one thing above all others for which our social system has no place it is the fatherless offspring. No one claims it, no one wants it, it has no name, no place, no one to provide for it, and so, if it live, it goes through life scorned and abused because of the accident of its birth that depends upon the faults of others.

Nothing so well emphasizes the necessity for lasting matrimonial alliances as the pitiable condition of these children. Is it not better not to be born at all than to be born to unending contumely? Many mothers-to-be think so, not only on the offspring's account, but also on their own, for the mother shares the misery of the child.

We have seen how a fall from virtue may be without permanent damage to the character if it can be kept secret, and how damaging it becomes as soon as others become cognizant of it. Here in the illegitimate child the sorrowing woman has a public badge of her—let us call it mistake.

Terrible punishment society inflicts! Disgrace at home, estrangement from friends outside, lost caste in the world, scorn and contempt from women, vulgar jests or indecent proposals from men are but a few of the multifarious means society has of perpetuating the sufferings of the sinner. And this sinner scorned by all the world is perhaps an innocent Marguerite with no thought of wrong in her soul, whose bosom heaves only with love and kindness, whose very being is gentleness and meekness, and who until now was loved and praised by all.

Strange contradiction of nature and society that this loving soul, because she loves too much, is suddenly destined to become a kind of living sacrifice to convention and to form!

Is it any wonder when the consequences to themselves and to their offspring gradually dawn upon them, these poor creatures in a frenzy of remorse and despair shall seek for escape at any hand that will destroy the growing badge of dishonor?

Yes, it is murder. To kill the unborn child is quite as much murder as to kill it at the breast. But who is the murderer? The mother whose whole being throbs with the rapture of expected motherhood and whose greatest pleasure will be to hug it to her breast and whisper happy nonsense in its ear, or society whose implacable ferocity, knowing no extenuating circumstance, realizing no modifying condition, warmed by no sentiment of pity, and looking only to her own interests, drives the dagger of despair into the heart of the mother and lets out the warm blood of affection?

Pregnancy therefore is the second punishment that lies in wait for the sexual misdoer. With it comes unending suffering, and those to relieve such suffering are ever at hand.

Society itself by its treatment of its units continually undoes itself, and by its severity in punishing one offense drives the offender into new and greater wrong.

VIII. THE REMEDIES.

Now how are we to wrestle with a problem that is rooted and grounded in every detail of personal and social intercourse? What can we do to correct an evil that we premise to have existed as long as man has existed, and predicted will last as long as he does? Obviously we cannot stop it, and our only hope must be to mitigate it. Dare we hope for this?

To read the world's history aright is to see that moral evolution has been continuous. The world is becoming better. Men's ambitions are more noble, their ideals more lofty, their sentiments more generous, their conduct more altruistic than ever before. Notable exceptions of course there must be, and sometimes whole countries have retrograded and nations become decadent, but the general mental and moral progress has gone on. The first satisfaction to be attained, therefore, is that we are not working against impossible odds; the tide is with us and success before us, though probably far distant.

Does the reader doubt that the sexual morals of the world are better to-day than a century ago? Public sentiment is against immorality to-day as never before, and open immorality meets with disfavor. Some one, however, objects that this only drives the evil from the surface into the hidden depths where it goes on as before. To this we think can be said that evil formerly went on in the depths and on the surface, and society was rotten to the core. Now at least we have cleaned up the surface, which shines with the beautiful light of future promise as regards the depths.

There can be no radical strokes at the social evil by which its limbs can be lopped off one by one. It is too big for that. We must get at it like the Lilliputians went at Gulliver, with a multitude of little cords, the totality of which bound him immovably hand and foot.

We must work a little here and a little there, always calculating what strength we have, and whether by tightening here we may not loosen there.

The giant has seemed so mighty in the past that society has capitulated with it, and there is still a lurking anxiety in many minds whether it is not best to let him sleep undisturbed at present, to get up and wreck our homes to-morrow, instead of beginning to bind him fast at once.

Education is the enemy of ignorance, and ignorance is one of the factors by which the social evil is kept up. It therefore becomes necessary that we educate each unit of our social system for the purpose of giving him or her a sufficient knowledge of the temptations they are to meet, and the means of overcoming them, to make him useful in strengthening society as a whole. The sexual education is sadly neglected, probably because no satisfactory conclusion has been arrived at as to what children ought to be taught. They should undoubtedly be taught a great deal, should be taught it very early and in such manner that the knowledge is progressive and applicable to the existing needs of the child. Too early it can hardly be begun, for the writer has knowledge of a little boy, aged seven, to whom the sex mystery was explained with personal demonstrations by a little girl of six. Within a year after the same children, coming together again, and the girl's knowledge having expanded, the boy was invited to have intercourse with her, and might have done so, as he had erections at the time, had it not been that in his innocence he suspected some practical joke was about to be played upon him and declined. An investigation in this case developed the deplorable fact that all of the young children of this neighborhood had been initiated into the sexual mysteries by the older children, among whom sexual intercourse was not infrequently

indulged in and much talked about, both in couples and in groups.

It is doubtful whether even among these older children of fourteen and sixteen years there was anything really vicious; all but a few seemed actuated by motives of braggadocio rather than pleasure or passion, so that the whole thing was really but a serious form of mischief.

Only a few months ago the writer had brought to his attention an interesting case in which a brother and sister, aged eight and six respectively, made a careful physical examination of a neighbor's child, aged three, in order to determine her sex for themselves.

Surely with such cases before us, and every physician and most men must know of similar ones, the necessity of beginning the sexual education of children early is clear.

They should be taught that there are physical differences between the sexes, that children are born, not found or bought or brought by storks or doctors. That as plants are fertilized by pollen, so animal seeds or eggs are fertilized by sperm, and fishes can be used as illustrations. By presenting it skilfully most of the matter can be left to the child's inference and to subsequent observation. The parent should regard this as one of his imperative obligations and should take the utmost pains that his sons and daughters are not first brought to a knowledge of these weighty matters by the jesting remarks or vicious expressions of servants.

Children are curious, and their curiosity should be guided into proper paths, then satisfied. Children are also confidential. It is best for them to confide in their parents, and not in other children. For this reason children of different families should not be permitted to be together for long periods without espionage. As puberty approaches its meaning should be made clear. The boy should be told that erections and occasional emissions are to be expected now, and that with this new power comes the ability to injure himself and perhaps ruin another should be misapply it.

Girls should be taught the significance of the menstrual flow; its relation to maternity, and of the breasts to lactation, should be explained, and the girl warned against permitting liberties of any kind being taken with her person.

The writer is keenly alive to the possible disadvantage of arousing a curiosity that might have slept, but which now awake leads a lad to investigate and experiment, but feels that in such cases the result is probably an inevitable outcome of the quality of the child's mind and must have come sooner or later.

As puberty passes the passions develop and the sentiments grow strong. Now comes the time when the personal efforts on the child's behalf must become organized efforts on the part of many parents to defend him from the obscene pictures, salacious books, vulgar songs, and suggestive plays with which large cities abound. Have you ever thought of the gratitude we should feel that our children are born to-day and here, instead of two thousand years ago in Rome? What must have been the thoughts of children in the days when statues of Priapus were reverenced in the market places, and when nudity, obscenity, and opportunity were on every hand? The pictures on the fences must not be obscene; the plays in the theaters must not be immoral; the books in the libraries must not be salacious. We have legislative enactments to help regulate these; let us have more. Let us see that they are executed and those who evade them apprehended and punished. We must keep our thoughts pure. In these youthful breasts there beat hearts fired with growing passion. Let the fires smolder as long as they can—the flames will leap forth all too soon at best.

Let us keep careful watch of our daughters,

for other fathers are not so watchful as we. There is my neighbor's son, a regular "devil of a fellow"—what if he should—but the thought is impossible, my daughter is too good, too pure, too noble! But if he or if some other scoundrel should seduce her what punishment could I bring upon him? Perhaps nothing, for my daughter is beyond the "age of consent!"

What a sophistry of human judgment is this matter of the "age of consent." Children of tender years are supposed to be able to comprehend the whole science of reproduction and are held responsible for the outcome of acts of which they have no clear conception.

The "age of consent" is usually based upon physical development—a grave mistake. It should be based upon intellectual development, and should be made such that girls of fairly mature bodies and minds might not be led into mischievous acquiescence in the desires of some scoundrel who afterward goes free while the victim languishes. We need protection. The scoundrel that seduces a girl is a menace to society, and he and not she should be punished.

And now the time of marriage for our sons and daughters approaches, and we have to encounter the two most grave of our social evils, the difficulty of securing a competency sufficient to marry upon, and the ease with which the passions can be gratified without marriage by recourse to prostitution.

Here are social conditions that are indeed difficult to overcome without revolution. But it should be the right of every individual to marry as soon as the suitable partner is found, and if society blocks this move she does so to her damage, for the postponement of marriage is one of the most potent causes of the social evil.

Let us hope that the social reforms of the future shall so alter the conditions of to-day that a man's right to marry shall be held sacred and inviolable.

As the time of marriage approaches the young men should be taught that venereal disease, resulting from promiscuous intercourse, is a hindrance to marriage, and that therefore it is a sacred obligation to be pure. With what countenance can one say this to young men consumed with appetite who doubt whether they will ever be in a position to marry? They should also be taught something about the duties of married men to their wives, and the philosophy of compatibility of disposition. Girls should be taught the same in their proper relations.

"Ah!" you say, "where are these grown-up young men and women to be taught all this?" You are to instruct your sons and daughters and I mine. How many parents of your acquaintance do you find assisting their sons and daughters to make appropriate selections in the way of life-partners? How many have ever talked with them of their future duties as husbands or wives? "Oh, but," you say, "this presupposes more intelligent parents than we have to-day." True enough, but in the future we must have wiser parents than we have at present, else the social evil cannot be mitigated.

But, with all our patient instruction, our boy being unable to marry, and experiencing the common impulses of mankind, seeks for relief where it can be found. He is one of the many whose self-control is not equal to this exigency. We are pained, but we are not the one concerned. He is in error—the most common of all errors. He is in danger. Have we done all possible to defend him? Not if all our endeavors have been with him alone, for knowledge of mankind in general should have taught us the possibility of defeat, and we should have planned so that when this time

came the moral harm should not be associated with physical harm. What have we done with the great masculine safety-valve, the prostitutes?

What shall we do with the prostitutes? Exist they always have and always will. It is an old fallacy that they can be successfully dispersed or expelled, or incarcerated or punished. They have endured every kind of punishment, every kind of humiliation, and when one has been put to death or driven out a dozen step into her place. Society needs them. Under present conditions it must have them. Suppose every prostitute in this city were suddenly and permanently done away with, what would the sexually irresponsibles do? The only outlet for their passions would be found in seduction and rape, and we would be far worse off than before. However unpleasant the thought may be to the moralist, prostitution is a necessary institution. We cannot do without it, and therefore we must regulate it and make it as safe as possible.

Now the prostitute is both a necessity and a danger, for while she saves virtuous women from seduction and rape, she on the other hand in her avarice is not content with what comes to her, but solicits trade from all with whom she comes into contact. We must recognize prostitution as a necessary and unavoidable evil and therefore deal with it thoughtfully and logically. If it is necessary and unavoidable, it must be given a legal standing and the prostitutes must have legal rights—a difficult matter unless there be some system of licensing and registering them. To those whose study of the subject has not brought them to the point of admitting that prostitution is a necessary accompaniment of our present social development the thought of licensing prostitutes is revolting, but we must have prostitutes, and therefore it is best that we know who they are, where they are, how many there are, and what their condition is as regards health and disease.

By registration and licensing the number of prostitutes per capita of population can be controlled and kept at so low a point that there will be no temptation for street solicitation or advertisement by which innocent, ignorant, and virtuous men can be seduced or victimized. The plan of segregating prostitutes in certain sections of the city where they can easily be found by those who want them, but need never be seen by those who wish to avoid them, has many advantages and is to be recommended.

The danger of venereal infection can undoubtedly be diminished by medical inspection at regular, frequent periods, but can never be overcome. To many this is thought to be degrading and disgusting. That women's bodies should be thoroughly examined for signs of transmissible disease may sound peculiarly to those ignorant of prostitutes and their habits, and such examination may be vigorously protested by the women, who object to the expense and possible loss of business; but what degradation can there be in a medical examination, conducted for proper reasons, of the body of one who for a small remuneration willingly exposes herself to any and every applicant?

But in this matter of examination and certification another and forgotten factor must be considered. What shall be done with the woman if she is found diseased? Shall she, who has legal rights, be incarcerated, or shall she be set at liberty with the admonition not to pursue her business while diseased? Either of these must fail to produce the desired effect because one is naturally averse to incarceration and because one must live. If, therefore, a prostitute becomes a fugitive from justice or has her license temporarily revoked because of

disease, unless very drastic measures are taken to prevent her from so doing, she simply transfers herself from the authorized to the clandestine group of prostitutes and plies her trade more dangerously than before.

The dangers arising from this condition of affairs are so grave that some special provision should be made for the comfort and care of diseased prostitutes. A home should be provided where they may be comfortably cared for and treated without expense and without undue restraint until once again certified "free of visible danger."

But you may say, is not this setting a premium on vice? Yes, it is, but only a limited number, and only properly registered individuals with doctor's certificates, may apply. Well, then, will not all the good accomplished be neutralized by the clandestine prostitutes, of whom we have already been told that they are more numerous and more dangerous than the public or authorized prostitutes? We must answer that question by considering the causes of clandestine prostitution and the remedies that are to be used for its amelioration. Much of clandestine prostitution is the result of ignorance. Girls have not been trained to defend themselves against temptation and fall in it through mischief, vanity, sentiment, poverty, and other circumstances. By additional education upon sexual matters good will be done and some will remain pure. Young men will be instructed in the dangers they run from "snaps," and will therefore be cautious in their dealings with them. The social reformer who desires to benefit his fellows will strive after higher wages for girl employees, so that there will be less temptation to eke out their livelihood by prostitution.

Legal measures must be instituted for the defense of the public. Clandestine prostitution should be a misdemeanor punishable by fine or imprisonment. Venereal diseases among both men and women should be reported. The source of the affection should be traced where possible and the woman if a clandestine prostitute treated for the disease and punished for the misdemeanor. When it can be shown that a man has infected a woman, he should be punished.

Would it not be ideal if every one enjoying the luxury of a venereal disease could be made to pay a tax—a good high tax—for the privilege? How many would use every precaution, even continence itself, to escape the tax! But the victims do pay a tax in physical torture and in doctor's bills, yet little good results.

In seeking to remedy or mitigate prostitution we must not be unmindful of the thought expressed in our chapter upon Prostitution, in which it was shown that a fall from virtue, the first step in the wrong direction, often terminates at the bottom of the social scale because of the unforgiving attitude of society toward those in error. Do we wisely in heaping calumny upon those who yield and fall? Is it just and right to forever keep them down instead of helping them up? It is true that society fears the fallen woman. She has transgressed the limits of propriety. What she has done she may do again—she menaces us with her tendency to reversion to primitive conditions, and her presence and influence are damaging to our children—but shall she be compelled to live in the mire if she desires to do good? This is too deep a problem for us, but it merits thoughtful consideration, and in dealing with those whose misfortune has been to follow the laws of nature rather than those of society, we must ever remember that society is artificial and that we, its creatures, are unreal, artificial, and inconsistent.

BOOK REVIEWS.

PREVALENT DISEASES OF THE EYE. By Samuel Theobald, M.D. W. B. Saunders Co., Philadelphia and London, 1906. Price $4.50.

This volume is described on the title-page as "a reference handbook especially adapted to the needs of the general practitioner and the medical student." That the author really means to write for the general practitioner is abundantly evident from his preface, in which he says that many works ostensibly written for the general practitioner and medical student are with a few exceptions little adapted to their needs, but cater rather to the requirements of the specialist. A treatise upon the eye really intended to meet the needs of the general practitioner should take into account the fact that the great majority of physicians are not skilled in the use of the ophthalmoscope, and that they cannot make trustworthy tests of refractive errors, visual anomalies, or of the visual fields, nor have they a desire to undertake the more delicate eye operations. These limitations practically handicap the general practitioner in the diagnosis and consequently the treatment of many important eye affections, but on the other hand there are other important affections of the eye which he should be competent to diagnosticate and treat successfully. A work of this kind should enable the practitioner to discriminate between those cases which he should treat and those which should be sent to a specialist. It should lay special stress upon the more frequent affections, and should draw a sharp line between those diseases of the eye in which delay in the employment of remedial measures is permissible or even desirable and those in the treatment of which time is an all-important factor. In offering suggestions as to treatment it should be concise and as specific as practicable. Such a book—not a complete treatise on diseases of the eye, but a concise description of the commoner ocular maladies—the writer has tried to produce. He has had in mind that "a little knowledge is a dangerous thing," and he has not thought it desirable to encourage the general practitioner to rely upon the ophthalmoscope as a means of diagnosis. Indeed, he has not even given a description of it, but has assumed that the knowledge which it affords is not at the reader's command.

An examination of the book from the standpoint of these limitations shows that the writer has produced not only an interesting but an exceedingly useful volume, though we feel that in many instances he has somewhat transgressed the limitations.

STENGEL'S PATHOLOGY. W. B. Saunders Co., Philadelphia. Fifth Edition, 1906. Price $5.00, cloth, net; sheep or half morocco, $6.00 net.

It always gives us pleasure to greet old friends, and especially is this true when we find them dressed in fashionable clothing and well informed upon current events, so that conversation with them may be both enjoyable and profitable to us. Stengel's Pathology is an old friend. It has stood the test of eight years' acquaintance, and we have found it faithful almost without exception. It has been our good fortune many times to comment favorably upon it in private, in public, and in print, and our opinion regarding it is so well known that it seems scarcely worth while to go into elaborate detail in the review of a fifth edition. Suffice it to say that the experience and knowledge of the author are reflected from the pages of his book, and that this permits him to speak with authority upon all matters upon which it has pleased him to write. Our careful review of the pages shows that exceptional care has been taken to introduce into each chapter and under each heading the newest discoveries and most modern opinions, which has been done without confusing the students by elaborate references to the literature, elaborate citation of authors, or prolonged controversy. The book is still essentially a text-book for students. One adverse criticism we feel called upon to make, however, lest our old friend should become self-satisfied, and it has reference to the illustrations, of which there are a sufficiency but of which the quality is rapidly deteriorating. It certainly does illustrations no good to be used again and again in successive editions of books, and to be copied indefinitely, and for this reason many of the pictures in Dr. Stengel's book have almost ceased to be useful, their details being obscured and their sharpness lost. It does seem as if a student who pays $5 for a book might be treated to a liberal number of new and original illustrations as well as to an amplification and improvement of the text. We doubt whether one could make a diagnosis of leprosy after having carefully studied Figure 96; and without going into more detail we will permit the matter to rest with this one criticism. However, the majority subserve their useful purpose, and their number sufficiently explains the text. The book certainly supplies all that a student needs, and whoever buys it and studies it will know all that can be expected of either student or practitioner of medicine.

A Treatise on the Motor Apparatus of the Eyes. By George T. Stevens, M.D., Ph.D. Philadelphia: The F. A. Davis Co., 1906. Price $4.50.

So much has appeared of late in reference to the extrinsic ocular muscles, and there is such a wide diversity of opinions on the importance of muscular imbalance in relation to certain functional nervous troubles, that Stevens's treatise will be welcomed by all who are specially interested in the study of ophthalmology. The work deals with the anomalies of the ocular adjustments and their treatment, together with the anatomy and physiology of the muscles and their accessories. It is illustrated with 184 engravings, some of which are in colors. When the writer published his work on functional nervous diseases in 1884, it was followed by a series of articles on the anomalies of the muscles of the eyes. The subject grew rapidly, and while, as set forth in the present volume, the writer does not look upon most of the questions as settled, he believes that a useful purpose will be served by bringing the available material together. In the domain of anatomy but little has been added to that which is already known, excepting to place before the reader the facts in a more available form than has heretofore been the case. The physiological section is treated from a much broader standpoint, the writer not hesitating to place new interpretations upon known phenomena and to advance a number of entirely new views, while placing some of the older views in a new light. In the pathological section the writer adheres to his original postulate that "difficulties of adjustments of the eyes are a source of nervous trouble, and more frequently than other conditions constitute a neuropathic tendency." It would serve no useful purpose in a review to touch upon the methods in controversy. Suffice to say that those who wish to obtain all the arguments in support of the importance of muscular imbalance will find them clearly set forth in this work.

Chemistry, General, Medical and Pharmaceutical. By John Attfield, F.R.S., M.A., Ph.D. Edited by Leonard Dobbin, Ph.D. Nineteenth Edition. Philadelphia and New York: Lea Brothers & Co., 1906. Price $2.50.

No text-book for the past 25 years, with the possible exception of Gray's Anatomy, has been so universally employed by medical students as Attfield's Chemistry. This, the nineteenth edition, has been revised from the eighteenth English edition, and is adapted to conform to the new United States Pharmacopœia. As a remarkable example of the favor with which Attfield's Chemistry has been received in different parts of the world, it is significant that in 1883 at the pharmaceutical exhibition in Vienna it was awarded a gold medal, and 13 years later at a similar exhibition in Prague was awarded a diploma of honor. Those familiar with Attfield a quarter of a century ago will not feel altogether strange in turning its pages. The same general arrangement is maintained and many of the old illustrations are reproduced. The old student of chemistry will be quite at home in the description of the inorganic compounds, but the remarkable change which was undergone by chemistry is especially noticeable in that portion of the work dealing with organic substances. It is in this part of the work that the more recent advances in chemical nomenclature are shown. This last edition of Attfield is thoroughly up to date. At the same time it has been kept within the compass of a practical manual for students of medicine and pharmacy.

A Manual of Pathology. By Guthrie McConnell, M.D., Pathologist to the St. Louis Skin and Cancer Hospital and to St. Luke's Hospital; Bacteriologist to the Missouri State Board of Health; Formerly Assistant Pathologist to the Philadelphia City Hospital. Published by W. B. Saunders & Co., Philadelphia, 1906. Price $2.50 net.

In the very modest preface of eight lines Dr. McConnell informs us that "this volume shall not attempt to take the place of the more voluminous text-books on Pathology, but shall enable the student especially to rapidly acquire the salient points of a subject. To this end the author has sought brevity, but has tried at the same time not to sacrifice clearness in the exposition of the material." The little volume is intended to form a book of the series of which "Steven's Manual of Practice" is the best known representative. It forms a beautiful, handy little volume, bound in leather with a flexible back. One can scarcely believe in taking up the book that it contains 496 pages of printed material, or that it contains 170 illustrations of good quality, carefully selected from the first-class text-books of W. B. Saunders & Co., and from a few European books of note. The scope of the book is comprehensive and seems to cover the entire field of Pathology. The subject is considered upon conventional lines, opening with General Pathology, in which there are seventeen chapters, and then discussing Special Pathology, in which there are ten more. Undoubtedly it will be a valuable book to students. We have failed to find important omissions. The distribution of space is very creditably made, unimportant subjects are dismissed with a few words and important ones given a just consideration. Naturally allusions to the literature, quotations from other works, references of all kinds, and theories are eliminated. Most of the illustrations having been made for larger books somehow one gets the impres-

sion that they are spreading themselves over these smaller pages, but this is no detriment to their usefulness, and indeed they form a very important if not essential part of a proper exposition of the subject. We know of no small work upon pathology which contains so much that is so good and bids fair to become so popular.

STUDIES FROM THE DEPARTMENT OF PATHOLOGY OF THE COLLEGE OF PHYSICIANS AND SURGEONS, COLUMBIA UNIVERSITY, NEW YORK. Vol. X. For the Collegiate Year 1904-1905.

This volume consists of a collection of twelve pamphlets, bound together to form a convenient volume. Professor Prudden in a preliminary note describes them as follows: "These reprints of the more important studies published by the workers in this department in various journals during the collegiate year 1904-1905 are brought together in this form for the convenience in reference of those interested in these themes.

"It has seemed to us that by this form of publication —first, the wider circulation which current medical journals afford, and the subsequent grouping together of reprints—the aims of such varied studies are more certainly accomplished than they would be by a special department or university publication.

"The contents of previous issues may be found at the end of this volume.

"The cost of reprinting and issuing these studies is defrayed by the Alumni Association of the College of Physicians and Surgeons."

It is, of course, impossible to review each of the important papers contained, most of which have appeared in appropriate journals, and have doubtless been read by the majority of those who are interested in the subjects. The College of Physicians and Surgeons of Columbia University is certainly to be congratulated upon the ability of its men to turn out so much that is excellent in the way of original research and writing.

INTERNATIONAL CLINICS. Edited by A. O. J. Kelly, A.M., M.D. Vol. III, 16th Series. Philadelphia and London: The J. B. Lippincott Company, 1906. Price, $2.00.

The last issue of the International Clinics comes to us with four articles on treatment, eight on medicine, eight on surgery, three on obstetrics and gynecology, and one each on rhinology, otology, and pathology. It is issued in the splendid style which characterizes this serial, and it contains numerous illustrations, one of which is full-page and in colors of an ovarian and tubal abscess. The first article deals with the treatment of acute pleurisy by Stevens. Then follows in order the treatment of certain forms of bronchitis by Patton, the treatment of dilatation of the heart by Katzenbach, and a critique of Fournier's recent modification of his treatment of syphilis. The section on medicine includes such articles as the irregular heart, the diagnosis of chronic joint affections, and milky urine; that on surgery deals with the more practical aspects of surgical work. We shall not attempt to review even the more important papers, as some of them will be referred to in the abstract department of this journal. In conclusion we can only repeat what has been said before regarding other issues of the International Clinics, that it is a valuable series, each volume of which contains over 300 pages of well-selected matter; that the books are well bound and contain an excellent index, which makes each individual book of value apart from the series.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Gustavus P. Head, M.D. Vol. 7, Pediatrics, edited by Isaac A. Abt, M.D.; and Orthopedic Surgery, edited by John Ridlon, A.M., M.D., with the collaboration of Gilbert M. Bailey, M.D. The Year Book Publishers, Chicago. 1906.

Dr. Abt in a succinct discussion of pediatric literature for the last year says in his preface that the most important papers have received notice. The individual papers have been referred to at some length with the view of presenting the most important facts in a connected and readable manner. No startling addition to the knowledge has been made in this field during the past year, though a great number of valuable clinical reports and laboratory investigations have been published in the current journals. Ridlon devotes fifty pages to a review of orthopedic surgery.

PUBLICATIONS OF CORNELL UNIVERSITY MEDICAL COLLEGE. Studies from the Department of Pathology. Vol. V, 1905, New York City.

In this volume are contained twenty-one pamphlets, forming a volume representative of the numerous attaches of the Department of Pathology of Columbia University. Every one of them is worth careful perusal, and some of them are eminently original in thought and in the treatment of the subjects to which they refer. While it is unjust to the other contributors to specifically mention any of these papers, we are obliged to confess that those entitled the "Bacteriolytic Power of Immune Serum and the Theory of Complement Diversion," "Enzymes in Tumors," "The Chemistry of Malignant Growths," "Cytotoxic Serum Produced by

the Injection of Nucleo-Proteids," by Buxton, Shaffer, and Beebe, "An Antigonococcus Serum Effective in the Treatment of Gonorrheal Rheumatism," and "The Treatment of Gonorrheal Rheumatism by an Antigonococcus Serum," have impressed us most.

PHOTOSCOPY (SKIASCOPY OR RETINOSCOPY). By Mark D. Stevenson, M.D. Philadelphia and London: W. B. Saunders Co., 1906. Price $1.25.

This is a brief monograph comprising five chapters dealing with this valuable objective test. The advantages of photoscopy are based upon the following facts: (1) The kind of refractive error, if any be present, is quickly diagnosticated. (2) Even those who are not expert in this method can obtain approximate results more quickly than by any other. (3) It saves much time. (4) It requires no expensive or complex apparatus. (5) No questions need be asked of the patient. (6) It is an objective test practically made without the patient's coöperation and wholly independent of his age, intelligence, visual acuity, or indifference. (7) It is by far the most accurate objective test of the present day, and by an expert operator nearly always fair, and very frequently absolutely correct, results are obtained. (8) It inspires confidence in the patient. (9) It gives a good idea of the refraction through particular areas of the pupil, which is often very important; in some cases it may be a help as to proposed operative measures. (10) By it we can determine objectively the amount of accommodation, which is especially of service in examining children. (11) It is indispensable in examining young children, the feeble-minded, and the illiterate; also in nystagmus, amblyopia, and aphakia. In examining stupid young or old people who insist upon describing everything they see and some things they do not see, or who have a fondness for reading the test type from the top to the bottom, this test is a friend in need. (12) It is simple; any one with ordinary skill and qualifications can quickly learn its principles and correct application.

With this statement of the general principles and reasons for photoscopy, the writer proceeds to give a very adequate and withal simple description of the method and the instruments required.

ABDOMINAL OPERATIONS. By B. G. A. Moynihan, M.S., F.R.C.S. Second Revised Edition. Philadelphia and London: W. B. Saunders Co., 1906. Price $7.00.

The first edition of the work of Moynihan on Abdominal Operations was extensively reviewed in these pages. The fact that a second edition was called for within a short time has convinced the writer that the work has met a well-defined want. It is significant of the contributions of Americans to abdominal surgery that out of three writers who in his opinion have added the most to abdominal surgery two are Americans, namely, W. J. Mayo and J. B. Murphy. The third is his former colleague, Mayo Robson. He says: "The mention of their names in the following pages, frequent though it be, is inadequate to express the manifold advantages that I have derived from a study of their work or from the privilege of watching their practice." The book contains 815 pages, divided into five sections. The first discusses general considerations and deals with such topics as abdominal incisions, penetrating wounds of the abdomen, acute peritonitis, tuberculous peritonitis, subphrenic abscess, and the surgical treatment of visceral prolapse. Section 2 deals with operations for perforating gastric ulcer and discusses operations upon the stomach in general, including the treatment of cancer of this organ, gastrostomy and jejunostomy. Section 3 deals with operations on the intestines, discussing first that difficult chapter of intestinal localization; then follows a chapter on intestinal suture, after which there is a description of the various operations on the intestine, together with an important contribution to the subject of embolism and thrombosis of the vessels of the mesentery. Section 4 deals with operations on the liver, and Section 5 with operations upon the pancreas and spleen. There is an excellent index. The illustrations are all original and are very finely executed.

ATLAS AND TEXT-BOOK OF HUMAN ANATOMY. By Dr. Johannes Sobotta. Edited with Additions by J. Playfair McMurrich, A.M., Ph.D. Vol. I: Bones, Ligaments, Joints, and Muscles. The W. B. Saunders Co., Philadelphia and London, 1906. Price $6.50.

The value of a good atlas, both in teaching anatomy and serving as a book of reference, cannot be overestimated. Both the publishers and the editor deserve praise for placing Sobotta's excellent plates before American readers accompanied by a satisfactory English text. Originally Sobotta's plates were published in a separate fasciculus apart from the text, but the American editor has done wisely in including the text and plates in a single volume. An effort has been made to make this atlas handy and practical, but not too comprehensive. The excellent atlas of Toldt, while comprehensive, is not practically useful to the student because of its wealth of detail, the beginner being quite unable to find out what he needs. It would be impossible for us to speak too highly of the 320 illustrations in this work, the most of which are in colors. The half-tone process has been employed to illustrate the bones, and the results both in artistic finish and clearness of outlines are superior to any plates that we have

seen produced by this process. Color lithography has been used in producing the colored plates, the results being all that could be desired. The difficult subject of nomenclature has been met by the editor by partially adopting the system reported by the Basel committee. It is to be regretted, we think, that more extensive use of the newer Latin nomenclature was not employed. It is practically as easy for the beginner to master these newer terms in Latin as it is in English, and their early and universal adoption should be the aim of all teachers and writers on anatomy.

THE EAR AND ITS DISEASES. By Seth Scott Bishop, B.S., M.D., LL.D. The F. A. Davis Co., Philadelphia, 1906. Price $4.00.

This is a most excellent treatise on diseases of the ear, including its anatomy and physiology, at least so much of these as it is important that the practical physician should know. That the general practitioner should pay far more attention to the condition of the ears is a matter on which there can be little question, and the important relation of aural and throat diseases emphasizes that those who undertake to treat the ear should be well versed in the conditions in the nose and throat which lead to aural disease. The tests for hearing are simply described; then follows a description of compressed air as used in aural work. Catheterization of the Eustachian tube has also a special description. The remaining three-fourths of the book is taken up with the various diseases of the ear and its accessory cavities. The work has an excellent index.

OBSTETRICS FOR NURSES. By Joseph B. De Lee, A.M., M.D. Second Revised Edition. Philadelphia and London: W. B. Saunders Co., 1906. Price $2.50.

Among the considerable additions that have been made to the literature for nurses is that of De Lee's Essentials of Obstetric Nursing. A *raison d'être* for this work would be found in the much-talked-about but too little practiced field of asepsis in the lying-in room. While this work is intended primarily for nurses the practitioner will find much of value in its pages, especially as it deals with subjects which the average teacher or text-book writer takes it for granted a physician knows. It deals with the anatomy and physiology of the reproductive system; then follow nursing during the labor and puerperium, and a third part dealing with the pathology of pregnancy, labor, and the puerperium. The latter includes the care of infants during the early weeks of life. There is an appendix treating of hospital versus home nursing, a dietary, glossary, and an index.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. By W. A. Newman Dorland, M.D. Fourth Edition, Revised and Enlarged. Philadelphia and London: W. B. Saunders Co., 1906. Price $4.50.

Dorland's medical dictionary is so well known that it scarcely requires extended comment. A new edition has been called for nearly every year since it first appeared. The last edition contains nearly 2000 new words and over 100 new tables. The volume contains 836 pages with 293 illustrations, 119 of them in colors. Notwithstanding these augmentations the work has been kept within a volume of convenient size. The aim of the author to produce a dictionary sufficiently full for the varied requirements of all classes of medical men as well as students has been kept in mind. That the work has been brought thoroughly down to date is shown by the fact that such recent additions to the literature as opsonins are mentioned and defined.

DIET IN HEALTH AND DISEASE. By Julius Friedenwald, M.D., and John Ruhräh, M.D. Second Revised Edition. Philadelphia and London: W. B. Saunders Co., 1906. Price $4.00.

This is a work of 728 pages, which the writers tell us has been prepared on practical lines. They have endeavored to give a reasonably concise account of the different kinds of food, their composition and uses, and also to set forth the principles of diet both in health and disease. A special effort has been made to simplify the subject so as to admit of ready reference by the busy practitioner. In the second edition many minor changes have been made, in which special attention has been paid to the recent work of Chittenden and others. The work is a valuable addition to the literature of dietetics, both because of its completeness and also because of the practical, simple manner in which the subject is presented.

A PRIMER OF PSYCHOLOGY AND MENTAL DISEASE. By C. B. Burr, M.D. Third Edition. Philadelphia: The F. A. Davis Co., 1906. Price $1.25.

The previous editions of Dr. Burr's little manual have been reviewed in these columns and heartily approved of. In this edition the section on psychology has been revised, as well as that on the classification in mental disease, to correspond with the many changes that have taken place. It was prepared primarily for use in training schools for attendants and nurses and also in medical classes. The practitioner who has but a limited entrance into the subjects of psychology and mental disease will find this little book useful as a groundwork for further study.

THE TECHNIQUE OF OPERATIONS UPON THE INTESTINES AND STOMACH. By Alfred H. Gould, M.D. Philadelphia and London: W. B. Saunders Co., 1906.

This work has its origin in a three-years' experimental study of gastrointestinal technique, the experiments being mostly made on dogs. These researches, together with a discussion of the standard operations on the intestines and stomach, are collected together in a volume of 302 pages, which is magnificently illustrated. No attempt has been made to give all of the methods in vogue, and many well-known operations are omitted, but it is believed that what is included will enable any surgeon to meet practically all the requirements of gastrointestinal surgery. Nothing could exceed the clearness and beauty of the 190 plates which illustrate this excellent work.

A SYLLABUS OF MATERIA MEDICA. Compiled by Warren Coleman, M.D. Third Edition. New York: William Wood & Co., 1906. Price $1.00.

This little volume of 186 pages is the product of classroom work which has convinced the author that materia medica is one of the most, if not the most, difficult subjects to acquire in the field of medicine. In part this is due to the fact that the student does not begin to apply the subject until he is brought in contact with patients. The purpose in preparing this book is to aid the memory by condensing the facts, repeating the doses, and grouping the drugs in various ways. It is not intended that this work shall replace the ordinary text-books, but that it will supplement them.

STUDIES IN THE PSYCHOLOGY OF SEX. Erotic Symbolism —the Mechanism of Detumescence—the Psychic State in Pregnancy. By Havelock Ellis. Philadelphia: The F. A. Davis Co., 1906. Price $2.00.

This is the fifth volume of the Studies in the Psychology of Sex. In them are clearly discussed the varied phenomena which underlie aberrations in the sexual sphere. Many writers have published more or less voluminous case histories, but it has remained for Mr. Ellis to place the subject on a proper physiological basis. In the volumes previously issued he discusses modesty, sexual inversion, the sexual impulse, and sexual selection. In this volume he studies erotic symbolism, which includes nearly all the aberrations of the sexual instinct, and in it he finds the key of the process. "In all of them—very clearly in some, as in shoe-fetichism; more obscurely in others, as in exhibitionism—it has come about by causes congenital, acquired, or both; that some object, some act or group of acts, has acquired a dynamic power over the psycho-physical mechanism of the sexual process, deflecting it from its normal adjustment to the whole of a beloved person of the opposite sex. There has been a transmutation of values, and certain objects, certain acts, have acquired an emotional value which for the normal person they do not possess. Such objects and acts are properly termed symbols, and that term embodies the only justification that in most cases these manifestations can legitimately claim."

That this is a true and broad statement seems self-evident. It is along these lines that the writer treats of the wealth of material that he has gathered. There is a discussion of detumescence, to which so little attention has been paid, and a brief chapter on the psychic state in pregnancy. The appendix contains the usual collection of histories of sexual development. The concluding volume of the series will deal with the sociological side of the sex problem.

Taken all in all the studies of Ellis have done more than those of any other writer to illuminate the obscure and too much neglected subjects of sexual physiology and pathology.

TEXT-BOOK OF OBSTETRICS. By Barton Cooke Hirst, M.D. Fifth Revised and Enlarged Edition. Philadelphia and London: W. B. Saunders Co., 1906. Price $5.00.

The splendid text-book of Hirst has been increased to 915 pages, and forms to-day probably the best American work on obstetrics. An examination of its contents shows that the text-book by a single author has not lost its place in American literature. The work is a magnificent example of the publisher's art, containing 760 illustrations, 40 of them in colors. The work has been so long before the medical public and has been so highly appreciated that an extended notice of its contents is unnecessary.

SAUNDERS'S POCKET MEDICAL FORMULARY. By William M. Powell, M.D. Philadelphia and London: W. B. Saunders Co., 1906. Price $1.75.

The eighth edition of this popular formulary contains 1831 formulas. There is an appendix containing dose tables; the formulas for hypodermic medication; poisons and their antidotes; diameter of the female pelvis and fetal head; obstetric table; diet lists; materials and drugs used in antiseptic surgery; treatment of asphyxia from drowning; a surgical remembrancer, together with tables of incompatibles, the eruptive fevers, etc. It is conveniently bound in flexible morocco, with a side index, wallet, and flap.

A Text-book on the Practice of Gynecology. By William Easterly Ashton, M.D., LL.D. Third Revised and Enlarged Edition. Philadelphia and London: W. B. Saunders Co., 1906. Price $6.50.

The work of Ashton has grown into a magnificent volume of 1097 pages which is a complete treatise on gynecology. It contains 1057 drawings illustrating the text.

"Behavior of the Lower Organisms." By H. S. Jennings, Assistant Professor of Zoölogy in the University of Pennsylvania. New York: The Columbia University Press; The MacMillan Company, Agents, 1906. 366 pp., 8vo. Price $3.00.

Beginning with the most lowly organisms and gradually ascending to others of moderate structural complexity, Jennings, by reference to many other writings, and by describing ingenious experiments of his own, brings out and carefully analyzes the behavior of a number of representative animals. Parts I and II are devoted throughout to the phenomena observed in Protozoa and Metazoa, while Part III enters delightfully and entertainingly into the philosophy of the subject. The whole is presented in a fascinating manner, and from the very start the reader is anxious to learn the author's idea of the forces that determine the reactions. These are finally summed up as follows: "The organism is a complex of many processes, of chemical change, of growth, and of movement; these are proceeding with a certain energy. These processes depend for their unimpeded course on their relations to each other, and on the relations to the environment which the processes themselves bring about. When any of these processes are blocked or disturbed, through a change in the relations to each other or to the environment, the energy overflows in other directions, producing varied changes—in movement, and apparently also in chemical and growth processes. These changes, of course, vary the relations of the processes to each other and to the environment; some of the conditions thus reached relieve the interference which was the cause of the change. Thereupon the changes cease, and since there is no further need of them the relieving condition is maintained. After repetition of this course of events, the process which leads to relief is reached more directly as a result of the law of readier resolution of physiological states after repetition. Thus are produced finally the stereotyped changes often resulting from stimulation. This method of regulation is clearly seen in behavior where its operation is, in the later stages, what is called intelligence."

A Compend of Genito-urinary Diseases and Syphilis. By Charles S. Hirsch, M.D. Philadelphia: P. Blakiston's Son & Co., 1906. Price $1.00.

This volume, though classed among the quiz-compends, is a compact treatise of 351 pages dealing with genito-urinary diseases. It aims to epitomize the subject as found in the larger works, and judged from this standpoint it is a convenient and compact presentation of the subject.

ABSTRACTS.

THERAPEUTICS.

Treatment of Pulmonary Tuberculosis.—

REISSMANN, C. *Australasian Medical Gazette,* vol. xxv, No. 9, p. 433, Sept. 20, 1906.

The first thing to do in a case of consumption is to prevent its spread, destroy the sputum, and segregate the patient. Male patients should be cleanly shaved and the ordinary handkerchiefs abolished. The patients should use paper slips so as to avoid soiling the hands, and these should be immediately placed in a metal box. A positive diagnosis of consumption can be made by finding the tubercle bacilli in the sputum or with the tuberculin test. The latter should be employed much more frequently than it is. It is obvious that in the early stages of pulmonary tuberculosis, and in all cases in which the lesions are closed, there may be no sputum or the sputum may be free from bacilli, and there are a small minority of cases that do not react to tuberculin. Granting all this there is no reason why the sputum should not be examined when there is any, or the tuberculin test be tried if the patient consents. When both tests are negative and the conditions lead one to suspect pulmonary tuberculosis, the right thing to do is to treat the patient as though he had the disease.

The sanatorium treatment of consumption is the only one that deserves consideration. In Germany, of 14,000 consumptives treated in sanatoriums 34 per cent were able to earn their living five years later. In the great majority of cases home treatment of consumption does not compare favorably with treatment at a well-managed sanatorium, but occasionally where the circumstances and temperament of the patient admit of it the treatment may be carried out very successfully at home. At a sanatorium a patient readily submits to the rigid discipline because everybody else does so, and he is removed from sources of excitement and other factors trivial in themselves but of importance in determining the patient's chances of recovery. As soon as the diagnosis is made the patient should be at once put to bed and kept there for a week. All external influences which react upon temperature and respiration are thus eliminated, and a more correct opinion of the extent of the disease and its progress can be formed. Rest is the best remedy. The patient should continue in bed as long as the temperature is at 100°, or if there is pain or other complications. As soon as it is considered safe the patient may leave his bed and dress, but he should spend the whole day lying on the lounge. After a few days, provided there has been no alteration in his condition, he may take a short walk on level ground, the distance being gradually extended until he walks several miles a day. Later he may be allowed to walk up a gentle rise, and this exercise is extended until the patient climbs a fairly steep hill twice daily. These exercises must be without rise of temperature, dyspnea, and there should be an improvement in the general condition. If such is the case he may be given exercises first with a light pick and then with a heavy one, later with a light shovel, and then a heavy one; this to be followed by a certain amount of wood-sawing and even wood-chopping, though the latter should only be employed in patients who have done especially well and whose natural occupation is arduous. No matter what the exercises they should be

graduated, and the patient should be examined daily, keeping a careful record of the pulse, temperature, and respiration before and after exercise. Almost every patient after he enters a sanatorium if put to bed gains in weight, and this gain will continue providing the exercises after he gets up are carefully graduated.

A consumptive should be supplied with a liberal diet, but the amount of food given should depend on the digestive powers of the individual. The prognosis largely depends on the digestive organs, and these must not be overtaxed. Fresh milk is an excellent food, and a patient may be given a tumblerful every two hours. This supplies 840 calories, about a quarter of the total heat value of a full diet. Raw beef can be employed, which is easily digested. Patients with poor digestion take raw beef very well, especially if it is called by another name, such as German sandwich or milk soup; the latter is made by shredding beef and suspending it in warm milk. Oils and emulsions of oils are useful because they are fatty foodstuffs. Cod-liver oil has no advantage over olive oil. The heat equivalent of a teaspoonful of olive oil is equal to that of one egg. Creosote, guaiacol, and drugs of like nature are of little service, except the patients suffer from flatulent dyspepsia. Inhalations of cyllin or oxygen previously passed through a solution of formalin are useful where the expectoration is offensive. For a cough due to irritation of the larynx relief is often obtained by the inhalation of a mixture of menthol and cocaine dissolved in friar's balsam and used in a nebulizer. For the diarrhea of phthisis nothing is better than a compound of tannin and albumin known as protan. Hemoptysis should be met by absolute rest in bed and restriction of the diet, the administration of Epsom salts, and the use of nitrite of amyl. When a patient has once had hemoptysis he is advised to carry a bulb of amyl nitrite in the pocket. Sometimes before the hemorrhage reaches the mouth the symptoms can be recognized by the patient, and inhalation of nitrite of amyl and rest will stop it. The tuberculin treatment unless governed by a study of the opsonic index is dangerous. This method, however, places it on a safe and scientific basis.

Fournier's Recent Modification of His Treatment of Syphilis.—

SAINGERY, H. *International Clinics,* vol. iii, 16th series, p. 27, 1906.

Fournier says that syphilis should be treated for at least four years after the infection, using what he calls a chronic intermittent treatment —a mercurial treatment extending over the entire time, but with periods of rest. He has been a consistent opponent of what may be called the intensive treatment, which, however excellent or even indispensable in overcoming certain grave and immediate manifestations of the disease, is not to be recommended as a routine measure. His present opinion is that the methodical treatment of syphilis may wisely extend over longer periods with wider intervals between. At the beginning an energetic course of mercury should be kept up methodically for the first two years, after which treatment should be suspended for two years, to be followed in the fifth year by another course of one year's duration. A third course of treatment should be given at about the seventh or eighth year. In justifying this change Fournier says that in all except unusual cases an ordinary mercurial treatment of two years' duration suffices to put an end to all manifestations for several years. The action of mercury is preventive, but it is temporary.

The worst forms of syphilis are those which are seemingly harmless at the start and yield at once to treatment, and then after a long period of silence break out in some tertiary

accident. This difference in the evolution of the disease is owing to the fact that where there is a multiplicity and repetition of the manifestations the patients are necessarily treated over and over again and at various stages more or less widely apart. Where there are no symptoms except the initial ones treatment is only prescribed during the early stage of the disease, which on this account has not had its virulence gradually attenuated by a series of mercurial cures, and has retained in consequence in a latent state its original virulence. The most manageable cases of syphilis are those which by means of frequent symptoms recall the disease to the patient's attention, and the bad case is the one that is lost sight of through lack of symptoms. In examining the history of 112 cases of paresis it was found that one began in the third year, and then there was a gradual increase until the tenth year, which had the largest number, to be followed by a gradual decrease until the twenty-fourth year, which was only represented by one case. He argues from these facts that mercury is indicated in the fifth and in the eighth years. This latter treatment is far better than to concentrate all the therapeutic methods in the first few years of the disease.

That there is still a wide divergence among syphilographers as to the best treatment of syphilis is abundantly evident from the contrary opinions held by Saingery, who holds that because a patient has taken mercury methodically and for a long time and does not get paresis he has by this means been protected from the disease. He says those who believe that paresis is of a syphilitic nature and that its basis is a syphilitic lesion and endeavor to prevent its occurrence by a mercurial treatment appear to act rationally, but in reality they are guided by a sort of "impression." That this may not be correct is shown by the fact that many syphilitic patients have been treated with mercury without its having protected them from relapse and tertiary symptoms. Why should the candidates for paresis be more effectually protected than these? Thousands of syphilitic patients, particularly in tropical countries, never take any mercury and yet escape paresis. It has been demonstrated that even a syphilitic patient requires in order to develop paresis to be of a peculiar constitution, gouty and congestive. He believes that the administration of mercury as a preventive in general paralysis cannot be demonstrated, but it like many other things in the treatment of this affection is based on impressions.

Drugs in Diabetic Glycosuria.—

CROFTAN, A. C. *New York Medical Journal,* vol. lxxxiv, No. 13, p. 636, Sept. 29, 1906.

Innumerable remedies have at different times been recommended for the cure of diabetes. None exercise a curative effect upon the disease and only a few appreciably influence the excretion of sugar. Most of the reports regarding drugs in this disease are made without sufficient dietetic control and do not exclude the natural spontaneous fluctuations in the disorder. Emotional and psychic states markedly influence sugar excretion and undoubtedly play some influence in the estimation in which drugs are held. While there are no antidiabetic remedies there are many drugs which favorably influence the general condition of the patient, counteracting or remedying complications, above all removing some of the distressing or dangerous symptoms which accompany this condition. Opium and its alkaloids will often remove the last vestige of sugar in glycosuria, but it does not exercise an appreciable effect upon sugar excretion in diabetics who are eating carbohydrate foods. Its action is always uncertain and the effects are never permanent. Many patients rapidly wear the drug out, so that the dose must be

continuously increased if its effect upon the sugar excretion is to be maintained. Such drugs as bromides, chloral, phenacetine, sulphonal and valerian may act beneficially in the neurasthenic type of the disease, but in most cases they are useless and often do more harm than good. Next to opiates the preparations of salicylic acid are the most useful. Sodium salicylate in 10- or 15-grain doses or aspirin in 5- to 10-grain doses several times a day may be given. They seem to increase the boundary of tolerance of carbohydrate foods. They should not be given to diabetics suffering from gastric or renal disorders. Jambul occasionally acts well in diabetes, increasing the boundary of tolerance for carbohydrates. Its action is very uncertain and its effect transitory. This drug wears out very rapidly, and if administered should be given uninterruptedly, for three or four weeks at a time, and again after an interval of four to six weeks. Jambul may be tried in every case which does not promptly yield to dietetic treatment. The drug may be given in the form of a dry powder in from 5 to 30 grains three or four times daily, in capsules, gradually increasing the dose until an ounce is given during the day. A more reliable and pleasant preparation is made by macerating the jambul in water. Two hundred grammes of the dried fruit, including the seeds, are finely powdered and macerated in two liters of water to which a small quantity of salt and a little salicylic acid are added. The watery extract is filtered off and 100 Cc. of the water taken cold every morning on an empty stomach, and in the evening before retiring. The salicylic acid is added as a preservative. Alkalies are always useful in diabetes, and it is good practice to give from 15 to 30 grains of sodium bicarbonate or calcium carbonate two or three times a day in every case for indefinite periods of time. Alkalies aid in counteracting the acidosis. Aside from this effect they are a hepatic stimulant and aid in the metabolism of carbohydrates. The good effect of many mineral waters is to be ascribed to the alkalies which they contain. Potassium iodide occasionally is of service, particularly in those types of diabetes where there is arteriosclerosis or syphilis. Organotherapy is disappointing, and the various liver extracts and brewer's yeast have not supported their early claims. General tonics, such as quinine, arsenic, and iron, are often useful in improving the anemia and stimulating the nervous system, but they exercise no appreciable effect upon the course of the diabetes.

The Pelvic Girdle in Abdominal Ptosis.—

SPIVAK, C. D. *American Medicine,* vol. xii, No. 7, p. 384, October, 1906.

The various trusses for displaced organs that have been devised are all worthless. The abdominal bandage is a more serviceable measure. The bandage is indicated in all cases of pendulous abdomen due to whatever cause, but in cases of enteroptosis the abdominal bandage is almost useless. In most cases of Glénard's disease the abdomen is small and flat and the abdominal walls thin. In a number of cases the abdomen is retracted, and the more emaciated the patients the more severe and annoying are the symptoms. It is obvious that an abdominal bandage which is concave in front can be of no service where there is nothing to lift. The symptoms experienced by those who suffer from accumulation of adipose tissue and one whose transverse colon is displaced are not due to the same cause. In an enlarged abdomen it is due to the increased bulk and weight, but in the case of a displaced organ the bulk and weight remain either the same or are even diminished. To relieve the symptoms caused by descent of the organs it is not sufficient to raise the abdominal walls, but it is necessary to exert a pressure on the

most dependent portions of the abdomen, at the same time to elevate them from before backward and from below upward, and these indications must be met whether the abdomen is large or small, pendulous or retracted. To meet the indications a pelvic girdle has been devised, which instead of being concave in front with both ends tapering is made of an oblong strip of elastic material of sufficient length to encircle the pelvis, and five or six inches wide. The girdle is applied in such a

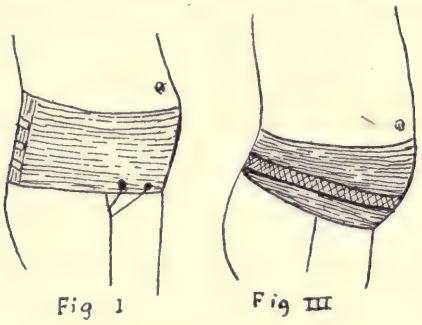


FIG. I.—Pelvic girdle. (After Glénard).
FIG. II.—Pelvic girdle.
FIG. III.—Abdominal bandage. (After Glénard). Note contour of infra umbilical region.

way that the lower border is in contact with the pubic bone; both extremities are passed horizontally above the trochanters and are fastened behind over the sacral region by means of three or four bands. To ascertain whether a pelvic girdle will be of service, the physician should stand behind the patient and place both hands over the hips, lifting up the lower part of the abdomen and at the same time making pressure backward. The patient who needs a pelvic girdle will experience a sensation of relief from weight and dragging and fulness.

Intravenous Injections of Koch's Tuberculin.—

ROTHSCHILD, M. *California State Journal of Medicine*, vol. iv, No. 9, p. 231, September, 1906.

The writer's conclusions as to the value of the tuberculin treatment are based on twenty-five cases, some of which have not been under observation a sufficient length of time to predict the outcome. While the intravenous method has been used for some time it is important to bear in mind some of the disagreeable symptoms which may follow if the injections are not properly made. There is more or less pain if the needle perforates the vein and gets into the tissue surrounding it. Thrombosis is caused if the point of the needle is not free in the lumen. Imperfect asepsis may lead to chills and prolonged fever, because the solutions are not sterile. Such accidents, however, are due to faulty technique and can be avoided by care. Patients, according to the reaction to tuberculin, may be divided into three classes: those in which the injections are followed by high fever, a second class with medium reaction, and a third class in which it is weak. The strength of the subsequent doses is based on the sharpness of this reaction. As a first trial dose one-third of a milligramme of Koch's tuberculin is injected. Usually the veins of the forearm are chosen for the injection. The patient lets the arm hang down and closes and opens the hand vigorously several times. Then a bandage is put on, which usually causes the veins to swell sufficiently to permit of an injection without trouble. When the veins are very small or deep the bandage may have to be removed and reapplied several times in order to get the veins well filled.

The first trial injection is made with one-third of a milligramme of tuberculin in normal salt solution. This first injection gives the character of the reaction and is an indication of the size of the dose with which to begin the treatment, and also how often it should be in-

jected; it is also diagnostic. Very soon after the injection the temperature begins to rise, going up to 102° or 104°, and does not fall in from twenty-four to forty-eight hours. In cases having a marked reaction the treatment should be commenced with one-tenth of a milligramme given once a week and slowly increased. It is of greatest importance to advance slowly. The desire to hasten the treatment is what has brought it into discredit. Patience and judgment in increasing the amount of tuberculin is of the highest importance. The main point in a good result is to use as much tuberculin as the patient will stand and to inject as often as possible, but to avoid a reaction during the treatment.

The Present Treatment of Diphtheria.—

CORNELL, W. S. *New York Medical Journal,* vol. lxxxiv, No. 17, p. 835, Oct. 27, 1906.

The present mortality-rate of diphtheria is too high. This result is not largely contributed to by men who do not believe in the value of antitoxin, though there are a few such, but more to the timidity with which it is administered by those who are fully convinced of its value. The value of early administration cannot be questioned, but the dose commonly employed is too small. In the Municipal Hospital of Philadelphia the routine dosage in the wards is 7500 to 10,000 units, while at the Willard Parker Hospital in New York the average dose is from 5000 to 10,000 units. The initial dose of antitoxin should be at least 2500 to 10,000 units, according to the severity of the case, which should be repeated every twelve to twenty-four hours. Immunizing doses should be from 500 to 1500 units. Notwithstanding the value of antitoxin general medication should not be omitted. Iron in the form of tincture is a favorite remedy, and mercury is held by many to be beneficial. Local measures are not now so important as they were previous to the antitoxin period, but they are still useful. They consist usually of iron, glycerin, and carbolic acid mixtures.

The writer has made a study of 616 cases of diphtheria treated in Philadelphia. Of these 458 received antitoxin, and 106 were treated without it. By far the larger number of cases were treated with 3000 units or less, and those that received 10,000 to 35,000 units numbered only 25. In this study of the treatment it is apparent that the doses of antitoxin are too small, and that nearly 19 per cent received no antitoxin. The causes of this are timidity on the part of the physician and a disposition to temporize with apparently mild cases. The profession should learn the lesson that antitoxin is a harmless remedy and may be administered in large doses. The prevailing notion that 2500 to 3000 units is the proper dose and that one injection suffices for an ordinary case is responsible in part for some of the mortality. At least 4000 units should be the minimum dose.

Methylene Blue in Cancer.—

JACOBI, A. *Journal of the American Medical Association,* vol. xlvii, No. 19, p. 1545, Nov. 10, 1906.

This substance was first used in the treatment of cancers by Mosetig-Moorhof, and for fourteen or fifteen years Jacobi has been using it internally, the injection method having been found too painful for general use. He has invariably treated the inoperable cases that came to him in this way, and has also followed up the operative cases with the treatment. He cannot say that he has ever cured a patient, but he has seen these individuals continue comparatively well for years under this treatment. Latterly he has been using it in connection with the light treatment on the presumption that methylene blue is one of the fluorescent substances favorably influenced by light, but he states that he cannot yet give positive results.

He thinks it has done him good service, and it is probable that the methylene blue and light combination will be more effective than methylene blue alone. He gives the drug in pills, in small doses, 2 grains a day, and runs up gradually to 3, 4, and 6 grains a day. The 2 or 4 grains should be made up into pills, with ¾ grain of extract of belladonna daily, and he frequently combines it with arsenous acid in doses of from 1/40 to 1/20 of a grain three times a day. The patient should be informed at the beginning that the urine will be blue and will stain the linen indelibly. Aside from this few will suffer any inconvenience. Not one in twenty will complain of dysuria. He would recommend it as a preventive of relapses in every case of breast or uterine cancer that has been removed. Jacobi thinks he has kept people alive for two, three, six, and eight years longer than they would otherwise have lived.

The Open-air Treatment of Pneumonia.—

NORTHRUP, W. P. *Journal of the American Medical Association,* vol. xlvii, No. 15, p. 1182, Oct. 13, 1906.

For over eleven years the writer has been using free ventilation and fresh-air treatment in pneumonia, and during the last year he has followed the practice of putting his patients in the New York Presbyterian Hospital for six hours a day out on the roof in all weather in which harsh, high winds, rain, and snow did not prevent. He gives histories of two cases, both serious, and in one of which he thinks the patient could not have recovered under other treatment. The hospital authorities are so well satisfied of the value of this method that they are making a colossal roof garden on the medical side of the hospital to be an open-air ward for these cases. The patients most favorably affected by open-air treatment are those with severe poisoning, with delirium, partial cyanosis or deep stupor. In Northrop's experience all patients do better in cool fresh air, which can be secured in private practice by screening off a portion of a room by an open window. None have been harmed, in his observation, and some have been greatly benefited and possibly saved by the cold fresh-air treatment. If pneumonia, due to an infecting agent, is thus benefited, the value of the treatment for other infectious diseases is suggested, and, in fact, he has tried it in many others, including typhoid fever with severe bronchitis, whooping-cough with bronchitis and convulsions, with excellent results. He considers it the ideal treatment for septic fevers. The only regulation is to keep the patient comfortable, and especially to keep the feet warm.

A Rational Therapy in Tuberculosis.—

POTTENGER, F. M. *Medical Record,* vol. lxx, No. 19, p. 725, Nov. 10, 1906.

The original tuberculin of Koch, his later preparations, as well as numerous preparations made by other men, if used properly, will stimulate the cells of the individual suffering from tuberculosis to the formation of defensive bodies, as is shown by the increase of the agglutinating and opsonic power of the blood. There are also certain sera which seem to furnish the antibodies already formed which are of some value. The best known of these are the Fisch, Maragliano, and Marmorek sera. One of the chief aims of the physician should be to maintain nutrition at the highest point. The hygienic-dietetic-open-air treatment has for its basis the betterment of nutrition. Open air is not a cure for tuberculosis. Used properly, however, it is one of the greatest aids to nutrition that can be employed. Open air should be supplemented by proper food and carefully regulated rest and exercise to make it most effective. Hydrotherapy is another measure of great value. The cheering and toning effect of sunshine is a very potent factor in aiding nutrition. The giving of raw meat

or muscle juice is also indicated. All distressing symptoms and complications should be carefully managed. In relation to this disease the writer urges a broader view and a more rational therapy, which considers the condition in all its varied aspects.

Saline Solution in Fever.—

TAYLOR, J. M. *Journal of the American Medical Association,* vol. xlvii, No. 19, p. 1551, Nov. 10, 1906.

The writer advocates the free administration by the mouth of the normal physiologic salt solution in all febrile conditions in children. He gives it usually every three hours, about half an hour before feeding time. With infants the solution is used in milk modification and for diluting whatever liquid food is used. The saline taste is hardly perceptible, and the children soon come to have no objection to it whatever. He argues that in fever the blood's main salt, sodium chloride, which is lost in large amount in excretions, is not replaced, owing to restricted diet, anorexia, and other factors diminishing the intake, and the blood is therefore deprived of one of its most important constituents. The regular administration of saline solution makes up this deficiency and aids the patient to overcome the disease.

Influence of X-rays on the Hematopoietic Organs.—

BELOT, J. *Archives of the Roentgen Ray,* vol. xi, No. 4, p. 108, September, 1906.

The writer concludes an article which has been running in this and the previous number with the statement that radiotherapy is the specific treatment for leukemia, and that the results are more favorable in the myeloid variety, but are also encouraging in lymphatic leukemia. In pseudoleukemia the results are slower, less certain, and less complete. Among these lymphoma is the most favorably influenced, while some other forms are quite refractory to the *x*-rays. Having regard to the absolute inutility of all other methods of treatment radiotherapy may always be tried, since if it fails it offers no sort of risk to the patient. The most important factor affecting the value of *x*-ray treatment of leukemia is the duration of the disease at the time when a patient comes under treatment. The earlier the better the results. In future better results will be attained as the patient is brought more promptly under treatment, due to a routine examination of the blood, which should be as regularly done as that of the urine. Such examinations will detect leukemic states in their incipiency, when the *x*-ray is more likely to prove efficient in their treatment.

Dried Tetanus Antitoxin as a Dressing for Wounds.—

KINYOUN, J. J. *Medical Record,* vol. lxx, No. 16, p. 613, Oct. 20, 1906.

The writer has applied powdered antitoxin to many minor injuries with a view to preventing tetanus. These accidents included abrasions, contusions, incisions, lacerated wounds, and a number of suppurating wounds. None of them were thought to be of a simple nature. It was evident that these injuries healed more rapidly and with less disturbance than had been previously observed in cases treated in the ordinary way. The powdered serum was apparently responsible for the good results. A number of infected wounds due principally to vaccination and furunculosis have been treated in like manner. In all of these cases there was rapid healing. These results show that the dried serum possesses qualities other than its specific body the antitoxin.

THERAPEUTIC BREVITIES.

Bier's Method in Writer's Cramp.—

P. Hartenberg (*Archives de Neurologie,* 1906) has used the elastic ligature method of Bier in patients with contractures and spasms of writer's cramp. The results have been en-

tirely satisfactory. He reports a case of writer's cramp which had lasted for five years in which recovery took place after two months' treatment. The treatment in this case consisted exclusively in the application of an elastic ligature applied about the arm above the biceps muscle for twenty minutes night and morning. After the applications were begun improvement was rapid.

MEDICINE.

Reports on Plague Investigations in India.—

Issued by the Advisory Committee appointed by the Secretary of State for India, the Royal Society, and the Lister Institute. *Journal of Hygiene,* vol. vi, No. 4, September, 1906.

These investigations comprise a group of ten papers, all of which are interesting and important.

Part 1: "Experiments upon the Transmission of Plague by Fleas." The first experiment has to do with the transference of plague from rat to rat by proximity without contact in the presence of fleas. In order to carry out this experiment a glass box of large size was so arranged as to contain two wire cages each standing in a tin tray. The cages rise above the level of the box at the top, the intervening place being bridged over by a fine variety of muslin impervious to fleas. The trays in which the wire cages rested were filled with dry earth or sand as a shelter for the fleas. The entire body of the glass box was covered with muslin tulle so that no fleas could enter from without. In these cages healthy rats contracted plague in consequence of living in the neighborhood of a plague-infected rat under circumstances which prevented the healthy rat from coming into contact with either the body or excreta of the plague-infected rat. In all cases a fairly abundant supply of fleas was present; these could pass freely between the two rats, and except for "aerial contagion" formed the only apparent means of communication between the animals. The presumption is that plague was transferred from the sick to the healthy rat by the agency of the fleas.

In a second series healthy rats were placed in flea-proof cages into which a certain number of fleas that had previously fed upon septicemic rats were placed. In 21 out of 38 experiments the healthy rats thus preyed upon by infected fleas died of plague.

The third experiment is upon the experimental production of plague epidemics among guinea-pigs kept in small cabins designed for the purpose known as "godowns." These "godowns" were as nearly as possible flea-proof, and the several series of experiments performed in them show that epidemic plague did not occur when healthy guinea-pigs lived in close contact with plague-infected guinea-pigs, under conditions where access of fleas was prevented, but in which under otherwise similar conditions plague spread among the healthy animals in places where fleas were abundantly present.

Series B showed that the transference of fleas from guinea-pigs dying from plague started an epidemic in an uninfected godown, which by the introduction of fresh fleas was maintained.

Series C showed that when an epidemic has occurred amongst a number of guinea-pigs the contagion still remains in the place, and is effective in proportion as the test animals are accessible to and found to be infested with fleas.

Series D showed that fleas removed from infected guinea-pigs and isolated in test-tubes can convey plague to healthy animals on which they are allowed to feed.

Series E showed that plague is not conveyed

from mother to offspring in the absence of fleas.

Series F showed that a monkey safely exposed in a plague-infected place where the free access of fleas to his person was prevented did not get plague; whereas his companion, not so protected, succumbed to it.

Series G gives the details of a number of experiments made in plague houses in Bombay, and were made by means of guinea-pigs running free in plague houses that had been previously disinfected; experiments with fleas caught on plague-infected rats found in houses; experiments with fleas caught on guinea-pigs and other animals which had been left for some hours in plague houses; experiments with animals in cages unprotected, in cages protected from fleas with fine wire gauze, also upon animals in cages surrounded with "tanglefoot" placed in plague houses. The final summary and conclusions of this portion of the work are as follows:

Guinea-pigs allowed to run free in plague houses in many instances attracted a large number of fleas, which fleas were mostly rat fleas. A certain percentage (29) of these animals contracted plague and died from the disease. The position of the bubo in the great majority of these cases was cervical.

If a plague house had been previously disinfected by the ordinary means of disinfection, fleas were still caught in large numbers on guinea-pigs set free in them. Further, a considerable number (29 per cent) of these animals died of plague. The bubo in the great majority of these cases was again in the cervical region.

Fleas transferred from plague-infected rats found dead or dying in houses were able to transmit plague to healthy animals in flea-proof cages in the laboratory. The bubo in all cases was in the cervical region.

Fleas transferred from guinea-pigs and other animals which had been placed for a few hours in plague houses were able to transmit the disease to fresh animals when fed on these in flea-proof cages in the laboratory. The situation of the bubo in these animals was in the great majority of cases in the cervical region.

Animals were placed in plague houses in pairs, both protected from soil and contact infection, and both equally exposed to aerial infection, but one protected from fleas by means of a fine metallic curtain and the other not so protected. None of the protected animals contracted plague, while several of the unprotected animals died of the disease. The position of the bubo in every instance was in the cervical region.

Animals were placed in plague houses in pairs, both protected from soil and contact infection and both equally exposed to aerial infection, but one surrounded with a layer of "tanglefoot" and the other surrounded with a layer of sand. The following observations were made:

Many fleas were caught on the tanglefoot, a certain proportion of which were found on dissection to contain in their stomachs abundant bacilli microscopically identical with plague bacilli. Out of 85 human fleas dissected only one contained these bacilli, while out of 77 rat fleas 23 were found thus infected.

The animals surrounded with tanglefoot in no instance developed plague, while several (24 per cent) of the non-protected animals died of the disease.

Paper No. 2 is a "Note on the Species of Fleas Found upon Rats, *Mus ratus* and *Mus decumanus,* in Different Parts of the World, and on Some Varieties in Proportion of each Species in Different Localities." The writer of this paper, the Honorable N. Charles Rothschild, is of the opinion that in house and port-

rats all over the world, excepting northern and central Europe, *Pulex cheopis* is the commonest rat flea, and in some localities is almost the only flea found upon rats.

Paper No. 3 is upon the "Physiological Anatomy of the Mouth-parts and Alimentary Canal of the Indian Rat Flea, *Pulex cheopis* Rothschild." This is illustrated by two handsome plates.

Paper No. 4 is on "The Effect upon Virulence of Passage of *B. pestis* through Rats by Subcutaneous Inoculation without Intermediate Culture." Twenty-six passages from rat to rat were effected without recurrence to artificial media, during a period of eighty-nine days. There was no evidence that the virulence of the bacillus underwent any alteration; the experiment, however, did show that the susceptibility of the Bombay rat to plague was variable.

Paper No. 5, "On the Effect upon Virulence of Passage of *B. pestis* through Rats by Cutaneous Inoculation without Intermediate Culture," shows that the Bombay rat is a difficult animal to infect with plague by this method, and that the plague bacillus retains its virulence in passing from rat to rat.

Paper No. 6 is "A Note on the Immunity of Bombay Rats to the Subcutaneous Injection of Plague Cultures," and shows that the Bombay rat is not more immune to plague now than it was two years ago.

Paper No. 7, "On the Infectivity of Floors Grossly Contaminated with Cultures of *B. pestis*," concludes that:

Floors of cow-dung grossly contaminated with *B. pestis* remain infective for forty-eight hours, the infectivity being tested by rubbing scrapings into susceptible animals.

Floors of chunam grossly contaminated with *B. pestis* do not remain infective even for twenty-four hours, the infectivity being tested by rubbing scrapings into susceptible animals.

Floors of cow-dung grossly contaminated with *B. pestis* remained infective for twelve hours, but not for twenty-four hours, to susceptible animals which were allowed to run about freely on them.

Floors of chunam grossly contaminated with *B. pestis* remained infective for six hours, but not for twelve hours, the infectivity being tested by allowing susceptible animals to run about freely on them.

Paper No. 8, "On the Number of Plague Bacilli in the Blood, Urine, and Fæces Respectively of Rats which had Died of Plague," shows that the blood of plague-infected rats may contain an enormous number of plague bacilli, even as many as 100,000,000 per cubic centimeter having been found before death. On the other hand, rats occasionally die from plague with little or no septicemia. An insect sucking the blood of most rats shortly before death would imbibe a large number of bacilli.

While the blood of a rat may have as many as 100,000,000 organisms in one cubic centimeter the urine may have none at all, or at least less than 10 per cubic centimeter. Plague bacilli were discovered in the urine in 29 per cent of the cases. When the urine does contain plague bacilli they are always present in much fewer numbers than in the blood.

The feces of rats dead of plague, and the blood of which contained abundant bacteria, are not highly infective, and would appear to play little part in the spreading of the epizoötic.

Paper No. 9, "On the Quantitative Estimation of the Septicemia in Human Plague," is the study of the blood of twenty-eight patients, involving the examination of 74 specimens of blood. *B. pestis* was not found in the blood of five patients whose illness ended in recovery, nor was it found in seven of the fatal cases. The salient points ascertained from an analysis of the remaining sixteen fatal septicemic cases may be recapitulated thus:

Microscopical examination of the blood cannot be regarded as a trustworthy criterion of the degree of septicemia.

A severe septicemia may be present at a comparatively early stage of the disease and for a considerable number of hours before death.

The septicemia may be of an irregular or fluctuating type.

Paper No. 10, "On the Existence of Chronic Plague in Rats in Localities where Plague is Endemic," discusses the seasonal prevalence of plague epidemics. It is a peculiarly interesting and well-known fact that wherever a plague is endemic at about the same date it yearly reappears, rises, declines, and disappears, usually entirely disappearing for at least six months. The form in which the infection remains latent has been much speculated upon by epidemiologists, and has been stated by Simond to be due to the occurrence of a chronic form of the disease among rats. In Bombay, where the commission has been systematically examining both rats captured in traps and all dead rats discovered by municipal sweepers throughout the year, and where large numbers, sometimes upward of 5000, have been examined weekly, chronic plague has not so far been discovered, although plague in rats has been found to exist to a small extent throughout the year. The existence of chronic plague in rats during the season when neither plague cases nor any acute plague among rats occurs, has been systematically searched for by the commission in the case of two villages, Kasel and Dhand, in Punjab, in which plague has recurred annually for three years without discoverable reinfection, and which are the object of epidemiological study at the present time. Observations upon these villages commenced in December, 1905, at a time of year when neither human plague nor rat plague, so far as could be discovered, existed; there was no special mortality among rats, and dead rats were seldom found. An extensive rat-catching was undertaken with the view of finding out whether plague existed among these rats. During December, 1900, rats were caught alive and regularly examined. Of this number none was found to be suffering from ordinary acute plague, but on December 12, 1905, two which until examined post mortem evinced no signs of illness were discovered to have chronic abscesses. From these abscesses an organism morphologically indistinguishable from *B. pestis* was obtained, and after cultural and inoculation experiments no doubt remained that these rats, which were running about in apparent health, were indeed suffering from chronic plague. During the following two weeks four more rats suffering from old abscesses were caught, and a fifth was caught in January, 1906. All of these abscesses proved to be due to chronic plague. It is a matter of considerable interest that the rats were caught alive during a period when no rats with acute plague were found, and when no human cases were occurring in the locality. It cannot be regarded merely as a coincidence that the lesions were in every instance situated within the abdomen. With our present knowledge it would be rash to speculate as to the method of infection in these cases, but it may be conceded that the most reasonable interpretation of the lesions involves the assumption of an intestinal infection. Examination of the animals that were killed furnished no indication that their health suffered in any way; the organs were apparently normal, and there was no emaciation, although the number of cases is admittedly small, and although it is difficult to estimate virulence in any degree of accuracy, yet it is noteworthy that of the animals inoculated directly from and with subcultures of these abscesses only one survived.

Venous Blood-pressure in Man.—

SEWALL, H. *Journal of the American Medical Association,* vol. xlvii, No. 16, p. 1279, Oct. 20, 1906.

The writer summarizes an extensive series of clinical and experimental observations in the following conclusions: (1) Our knowledge of the circulation must be built up by induction on specific facts. (2) The venous system falls functionally into two divisions, the somatic and the splanchnic. In the superficial vessels of the former the blood-pressure is easily measured and is determined partly by local causes and in part by circulatory conditions elsewhere. The channels of the splanchnic division are capable of accommodating the whole blood mass, and the general arterial pressure is probably chiefly regulated by the conditions of the splanchnic circulation—is raised by the contraction of its vessels and lowered by their dilatation. In the upright position blood tends to gravitate into the splanchnic area, but in the normal human subject there is a compensatory vascular contraction, somewhat overbalancing the force of gravity, so that the maximum arterial pressure at least is slightly higher in the upright than in the recumbent position. In debilitated subjects this compensation may be deficient and arterial pressure decidedly lower in the upright than in the supine posture. This is often evidenced by failure of the radial pulse when the arms are elevated above the head while standing. In the lower animals excessive arterial pressure is prevented by reflex inhibition of the vasomotor center for the splanchnic area through the depressor nerve. The frequent failure of pulse in the elevated wrists of patients with valvular heart disease, who have high blood-pressure, indicates that an essential functional peculiarity of such disease is a heightened irritability of the depressor reflex. (3) Venous blood-pressure may be raised either by increasing the inflow or by decreasing the outflow from the veins. The former may be caused by local exercise of the member examined, the latter by elevating one arm while the venous pressure is measured in the other. (4) Muscular exercise, local or general, raises venous blood-pressure and presumably pressure in the right side of the heart. (5) Intrinsic contractility of the superficial veins plays an important part in their physiology, and probably through this the valves are brought into action. The natural external stimuli of the venous contraction are cold and light mechanical irritation. Venous pressure is lowered by cold, which contracts the arterioles, and is raised by heat, which dilates them. (6) Inspiration normally dilates the superficial veins of the extremities and increases the blood-pressure within them. The respiratory movements of the veins rise from respiratory changes in arterial blood-pressure. Transmission of cardiac pulsation into the veins is common. (7) During digestion the pressure on the veins of the hands sometimes falls and sometimes rises. The former is probably a sign of the most perfect physiologic compensation; the other may be looked on as a sign of the relative physiologic weakness. (8) Cases of disease involving the apparatus of circulation compared with normal subjects can be naturally classed under four heads: (*a*) The ratio of arterial to venous blood-pressure is increased. This is due to positive elevation of arterial pressure, produced in some cases by such disorders, possibly, as vasomotor spasm or increased viscosity of the blood, or in others by arteriosclerosis. (*b*) The ratio of arterial to venous blood-pressure is decreased. This is usually due to positive elevation of venous blood-pressure, either by physical obstruction to the output from the right heart or by functional changes involved in the so-called gouty diathesis. Abnormally high venous blood-

pressure, not accounted for by mechanical causes, is a clinical sign of disorder of intermediary metabolism. (*c*) The ratio of arterial to venous blood-pressure is not materially changed, but both pressures are abnormally high. Such a condition is found in general plethora; persons in a certain stage of gouty dyscrasia belong to this class. (*d*) The ratio of arterial to venous blood-pressure is not materially changed, but both pressures are abnormally low. Most cases of simple asthenia probably fall within this class. The condition has been noted in individauls recovering from broken compensation attending mitral insuffiency. Although one and the same subject at different stages in the development of his dyscrasia, as in gout, may occupy a place now in one, now in another of these classes, the discernment of the circulatory attributes by which the allotment must be made on any specific occasion is of the utmost pathologic interest and therapeutic importance.

The Motor Degenerative Sequence in Dementia.—

TOMLINSON, H. A. *Journal of the American Medical Association,* vol. xlvii, No. 17, p. 1338, Oct. 27, 1906.

The writer points out the dependence of motor manifestations on mental activity, conscious and unconscious. In dementia, loss of capacity comes first in the highest coördinating and relational function, leaving the primitive inhibitory function comparatively unaffected. The process of degeneration attacks first those motor activities involved in the most abstract forms of expression, showing itself in the coördinated movements that are latest in the order of development. When memory and power of attention become impaired there is loss of mobility of the facial muscles of expression. Then the arms are affected and the lower extremities follow in order, though here the paresis is apt to be more symmetrical and not so extreme. Finally, the head becomes flexed and the neck muscles rigid. That these are not due to cord involvement is shown by the fact that they appear in temporary cerebral states, and that in dementia they appear and disappear, and are persistent only after mental reduction becomes extreme. In Tomlinson's experience, when the motor degenerative changes follow this order of sequence the change is a permanent one; but when it is not followed there is always a chance of a more or less complete return of the motor power. When the motor involvement is as described, everywhere over the superior part of the frontal lobes and the anterolateral portion of the parietal lobes there is shriveling of the cortical gray and underlying white substance. When the sequence is not followed, only the frontal lobes are involved.

Bacteriological Examinations of the Conjunctival Sac in Typhoid Fever and in Pneumonia.—

RANDOLPH, R. L. *Bulletin of the Johns Hopkins Hospital,* vol. xvii, No. 187, p. 324, October, 1906.

The writer has examined the conjunctival sac in reference to its bacteriological contents in 100 cases of typhoid fever and 148 cases of lobar pneumonia. In some instances the examinations were repeated daily throughout the entire course of the disease. He was unable to recover the typhoid bacillus, but in two instances the pneumococcus was found, and in one of these patients it was associated with a conjunctivitis. His investigations of the conjunctival sac in healthy individuals as well as those in individuals under the influence of the infection have demonstrated the almost constant presence of one organism, so that he has come to regard it is an invariable inhabitant of the conjunctival sac. He believes that this organism has a defensive action either by its numbers, or by the products which it produces, protecting the conjunctival sac from infection by other organisms. The organism in question is the micrococcus albus. Attention is

called to the part played by the bacillus vaginalis, Döderlein, which seems to be largely responsible for the peculiar reaction of the vaginal secretion, a reaction which helps to keep sterile this part of the genital apparatus.

Neurasthenia.—

RICHARDSON, H. *Medical Record,* vol. lxx, No. 19, p. 728, Nov. 10, 1906.

The writer classifies the etiological factors of neurasthenia under four heads: (1) Mental strain; (2) disturbances of digestion, malnutrition, and autointoxication; (3) toxemia from infectious diseases; (4) traumatism and shock. It is apparently the vasomotor system which is principally affected. All emotions act upon this system of nerves. An important etiological factor from a therapeutic standpoint is a gouty constitution. In a case of this kind the urine is intensely acid and the carbon nitrogen factor is very low. The most marked symptom is irritability of temper. Among the various symptoms of neurasthenia are headache, insomnia, pains in the spinal column, disordered digestion, disturbance of the blood-pressure, angina, depression of the functions of the genital organs, and disorders of the mental faculties. There is no specific treatment for neurasthenia. The whole system should be built up in every possible way. The physician must first gain the patient's confidence, and then hold him to his treatment by tact and patience.

Angina Pectoris: Its Mechanism and Treatment.—

HARE, F. *Medical Record,* vol. lxx, No. 16, p. 601, Oct. 20, 1906.

The pain of angina pectoris is due to vascular distention of the mediastinum, caused by a localized vasodilatation and an accompanying more or less generalized peripheral vasoconstriction. Two other factors in the mediastinal distention which have to be considered are the work done by the left ventricle and the integrity of the mitral valve. Whatever reduces the work of the left ventricle will reduce the distention, and *vice versa.* The integrity of the mitral valve is essential for the development and maintenance of the mediastinal vascular distention. The writer believes that the ordinary anginal seizure conforms in its mechanism to many other paroxysmal affections, such as migraine and asthma, which may be referred to as a vasomotor neurosis. Inhalation of amyl nitrite is the most prompt and reliable means of relief in most cases. Iodide of potassium in large doses affords in many cases marked relief from the tendency to the recurring paroxysm.

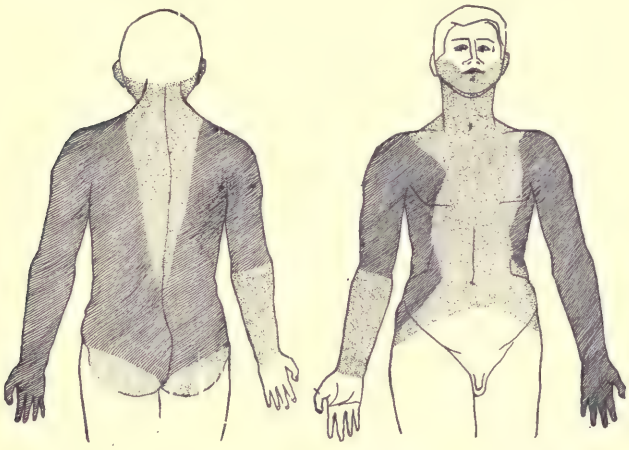
SURGERY.

The Treatment of Burns and Skin Grafting.—

SNEVE, H. *Journal of the Minnesota State Medical Association,* vol. xxvi, No. 13, p. 243, July 1, 1906.

Attention is called to the severity of extensive burns. In spite of the pastes, powders, and salves which have been recommended, the mortality of burns involving more than one-third of the body surface is nearly 100 per cent. The experience obtained by the writer's method now exceeds 100 cases, and it has been adopted as a routine measure in the City and County Hospital of St. Paul. The first consideration in the treatment is to overcome shock. The first indication is to use some remedy which will combat the fundamental disturbance, which is the vasomotor paresis. Adrenalin is the only drug that will do this. Whisky, morphine, strychnine, digitalis, and atropine should not be given. While they act as heart and circulatory stimulants when the

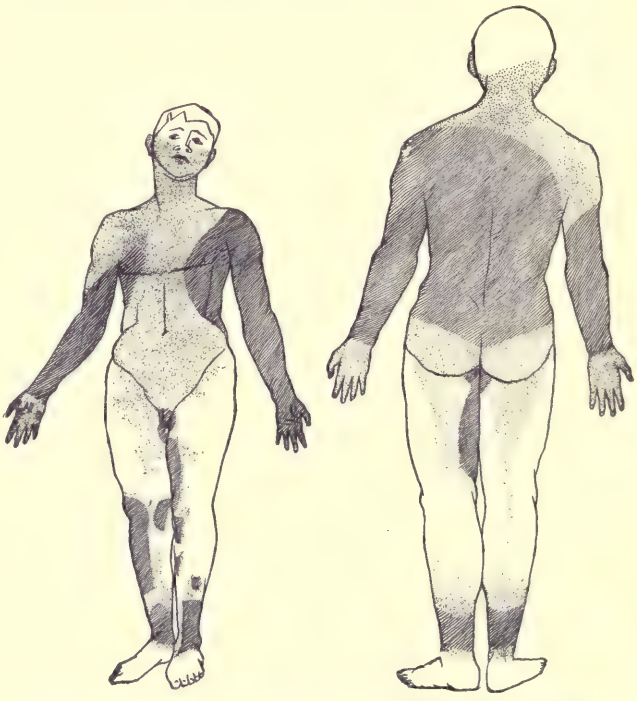
body is in a normal condition, in shock they are only poisons to the susceptible nervous system already struggling under a great load. To counteract the fall in body temperature



FIGS. 1 AND 2.—The light stippling indicates a burn of the first degree, and the lines a burn of the second degree. There is, besides, a large area around the right axilla of the third degree. Recovery.

the hot bath should be used or the patient wrapped in hot blankets.

Occlusive dressings have been used from time immemorial in the treatment of burns, as the exclusion of air from the burned surface relieved pain. The bacterial origin of suppuration lent strong support to occlusive dressings, which were thought to prevent the swarming enemies in the air from infecting the wound. In the first hours of a burn the areas are effectually sterilized by the heat, and when eschars separate nature has granulations which protect against invasion and drainage can easily be kept almost perfect. In burns of the second degree the dry crusts, assisted by some dusting powders, render the field impregnable to germs, which require heat and moisture for their development. The writer expresses the belief that the occlusive dressings are largely responsible for the absorption of ptomaines or other poisons. He says whenever a crust formed over a granulating cavity which did not allow the escape of the secretion we could look for a rise in temperature or even albumin and casts in the urine; on the other hand, when the surfaces were kept clean and drainage was perfect there was absence of the signs of intoxication. In one case the promptness of absorption was shown by the acute poisoning which resulted from the application of a picric acid dressing. In twenty minutes the patient was delirious, the temperature and pulse rapidly rose, and the urine turned to a yellowish-green which almost solidified on boiling. To avoid toxemia after serious burns the secreting surface must be kept clean and free perspiration must not be interfered with. Infection should be avoided by aiding nature to make the surface impregnable to germs by the formation of adherent crusts, under which healing goes on rapidly. The kidneys and bowels should be assisted by free flushing, nothing being better for this purpose than normal saline solution. At least



FIGS. 3 AND 4.—Showing the extent of the scald. The light stippling indicates burns of the first degree, and the lines indicate burns of the second degree.

forty per cent of the deaths in burns of extensive areas are due to the use of occlusive dressings.

The skin must be looked upon as having complex functions affording protection and having nerve endings which furnish information to the central organs by which the circulation is governed. It also has the function of secretion, carrying off about two pounds of transpiration each day. These important functions of the skin are one reason why Hebra's full bath is not the best treatment for extensive burns. The skin is not functioning under normal conditions. Cold spongings and frictions are the best stimulants to skin function, and these measures should be frequently used in treating extensive burns. Artificial heat should be supplied, and a temperature as near the body heat as possible should be maintained constantly in the first weeks of a severe burn.

Long-continued suppuration leads to general emaciation and exhaustion. The best preventive is the early employment of skin grafting. The method of skin grafting adopted by the writer avoids the use of the occlusive dressing. Thiersch grafts are placed on the denuded surface, which has been prepared in the usual way, and then the parts are exposed to the air. Small blisters appear on some of the grafts; these are opened and the contents withdrawn. The writer believes that grafting from the skins of chickens, guinea-pigs, and rabbits will again become popular. The best preparation for skin grafting is a daily sunbath with the open-air treatment of the wound, as in this way the granulations become small, firm, and healthy looking, and the borders from which the epidermis is extending take on a healthy activity. When Thiersch grafts are applied to such a surface they adhere firmly within six or eight hours. The serum that oozes out between and around them should be

FIG. 5.—This photograph was taken on the twenty-fourth day after the accident. Most of the burns are healed. Recovery.

carefully wiped up with gauze sponges, and the small vesicles which raise the epidermis should be carefully opened. Cleanliness must be observed, and if necessary a wire cage may be strapped over the part during the night in cases where the bed coverings are not supported on cradles. Excessive granulations are prevented by exposing them to the direct rays of the sun every day.

When first seen burns, and particularly scalds, are apt to prove deceptive. Whenever occlusive dressings are kept on even for forty-eight hours they will frequently convert a first into a second and a second into a third degree burn through confinement of the perspiration and maceration of impaired tissue. The pain is of short duration and not severe when the wounds are left exposed to the air. Severe pain when not obscured by shock lasts only from six to twelve hours, and it is better controlled by hypodermics of morphine than by any other measure. The morphine should not be given when shock has already developed. Under this method of treatment the burns of the second degree result in only a white scar, while third-degree burns have a smooth, flexible, skin-like cicatrix. Two factors probably account for this. The tops of the granulations which grow into the meshes of the dressings are not torn off day by day forming ridges through the substance of the scar. Exposure to the air determines the growth of firm, small, healthy granulations, a marked contrast to the large, flabby masses which are produced in the moist chambers of an occlusive dressing. The length of time for the skin to form over the burn is only about two-thirds that required under occlusive dressings. The patient should be kept surgically clean, avoiding strong antiseptic solutions, and the sound skin should be frequently sponged and frictions employed. The temperature of the room should be kept high. In private practice an improvised barrel-stave cradle can be employed to keep the bedclothes from contact with the wound. All blisters should be cut away, the parts being cleansed with normal salt solution and dried thoroughly, the parts being dusted with stearate of zinc, occasionally wiping away serous exudate until dry, brown, adherent crusts are formed. In burns of the third degree a serum will exude which hardens and forms a tough, transparent membrane. If this is left on it dries and cracks and forms large

FIG. 6.—Showing extensive burns. Recovery.

scabs. These crusts should be removed so that the secretion underneath will not form little lakes, which may easily suppurate, and from which absorption may occur. This can be accomplished by the removal with sponges and salt solution, or by putting the patient into a tub of normal salt solution every day and

FIG. 7.—Showing the cradles.

soaking the crusts off. This must be kept up until the granulations are ready for skin grafting or until healing occurs without it. These burns should not be powdered. So far as possible the functions of the body should be preserved and the limbs should be exercised as much as possible. The eschars of burns of the fourth degree should be removed and amputation performed when needed.

Submucous Turbinectomy.—

STUART-LOW, W. *Clinical Journal,* vol. xxix, No. 1, p. 13, Oct. 17, 1906.

The bane of intranasal surgery in the past has been that too much has been done in the way of clearing the obstructed nasal passage. Too much soft tissue is removed, the taking away of the erectile tissue and mucous lining preventing the proper function of the nose in warming and moistening the air. The soft tissues should not be unnecessarily sacrificed, and this is accomplished where the turbinals are enlarged by the writer's anterior submucous turbinectomy. The ideal method of removing the projecting turbinals is one which lessens their volume but preserves the soft covering with its mucous glands and conserves the underlying erectile tissue. The turbinals are crescentiform in structure, except at the outer attached border where the bone is denser. The inner two-thirds is always frail and mesh-like, and therefore can be easily cut through. The inner part of the bone overhangs the floor of the nose. The submucous tissue is not firmly attached to the periosteum, and it can be elevated without difficulty. A submucous resection can be made of either the inferior or middle turbinals. The method consists in incising and dissecting up the soft structures from the underlying bone, and then making a submucous resection of the bone and extracting the resected portion. After the removal of the bone the flaps subside on the outer wall of the nose and their integrity is maintained. The operation can be easily conducted under local anesthesia. A ten-per-cent solution of cocaine should be applied to the inferior turbinal, after which a pad of wool soaked in this solution is applied for ten minutes to the turbinal surface.

If it is thought desirable to obtain a more perfect anesthesia a submucous injection of eucaine or cocaine may be made. An incision is then made through the mucous membrane down to the bone by a short-bladed, crescent-shaped knife. The incision should extend longitudinally for nearly half the length of the turbinal surface and be along its most dependent part. The incision should be continued anteriorly to the attachment of the turbinal to the outer wall of the nose. A sharp-pointed, small, curved deflector should then be introduced at the incision and the soft tissues raised from the bone. This is done both on the upper and under surfaces by cautious manipulation. An upper and a lower flap are gradually freed. A blunt, curved deflector is used after the sep-

aration has gone a little way. A special long speculum with slightly curved blades may be used to assist in separating the mucous membrane and maintaining a good view of the bone. The bone is removed by severing with a pair of short-bladed sharp scissors the anterior portion, the posterior being broken through with the aid of a forceps. After the bone is removed the flaps should be pressed outward onto the outer wall of the nose and maintained in position by means of plugs of cotton-wool firmly packed into the nasal passage, the object being to bring the cut edges into apposition. When the middle turbinal is operated on the same steps are followed, but the incision is carried along the under surface and up along the anterior border. The soft tissues are deflected from the bone on each side, and the bone is removed either with Grunwald's forceps or curved scissors. The flaps are then pressed together by means of woolen plugs pressed up on either side, one on the anterior septum and one on the anterior wall. There are no disagreeable after-effects, as the parts heal by first intention. The subsidence of the enlargement of the turbinal is permanent, and if properly performed there can be no failure of the operation nor any necessity of its repetition.

Prostatectomy.—

FERGUSON, A. H. *Journal of the American Medical Association,* vol. xlvii, No. 15, p. 1153, Oct. 13, 1906.

The writer classifies the cases of prostatic hypertrophy as follows: (1) Cases manifesting genito-urinary functional disturbances in the first congestive stage of the disease, in which proper hygienic and local treatment may effect a cure, or at least in some cases avert operation. (2) Cases with partial retention, in which the condition progresses insidiously, revealing itself in an acute attack of retention with subsequent residual urine and the necessity of catheterization, or more chronic gradual distention of the bladder with intermittent dribbling of urine. (3) Cases with complete retention with frequent involuntary urination and almost constant dribbling at night. (4) Cases of absolute incontinence and no residual urine. Prostatic enlargement does not always call for operation; the gland may be extremely large and yet cause no obstruction. Obstruction is the one important thing.

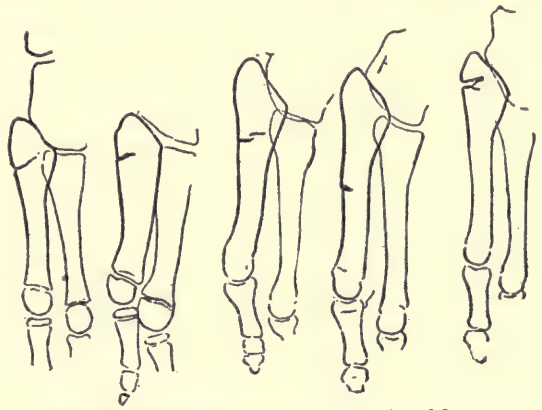
Ferguson enumerates in detail the pathologic indications for prostatectomy: the conditions that interfere with the function of the vesical meatus; the obstruction of the flow of urine in the prostatic urethra; the contraction and cicatrization of the organ from chronic inflammation; the deleterious effect of prostatic obstruction on the bladder, kidneys, and rectum. He reviews the literature bearing on complications, sequelæ, and mortality, and describes his own practice in performing the perineal operation. He puts the patient preferably in the extra-lithotomy position, and, while he prefers to open the membranous urethra and proceed down to the sinus pocularis at the point where the ejaculatory ducts open, he has frequently removed the prostate without any injury to the membranous urethra. After splitting the capsule laterally, it is best to enucleate the lateral lobes first, carefully avoiding injury to the ejaculatory ducts. The finger is pressed into the prostatic urethra and acts as a guide, while the fibrous attachments between it and the prostate are cut away with cutting forceps. In case the ducts are pushed to one or both sides, and the prostatic enlargement rises up into the bladder, he inserts the depressor into the bladder through the perineum to aid the finger in the enucleation. Care should be taken not to injure the vesical sphincter in removing prostatic nodules behind the bladder, and it is best, he states, to do this, piece by piece, with the biting forceps. When

there is a polypoid middle lobe projecting into the bladder he removes it by way of the internal vesical orifice. While it is sometimes impossible to save the upper prostatic urethra, especially if the enlargement completely surrounds it, it is not necessary to remove the whole of it, as is done in the suprapubic operation. In suitable cases it is possible to remove the whole prostate without injury to the bladder, ejaculatory ducts, or prostatic urethra. In cases in which there is no necessity of saving the procreative power the ejaculatory ducts are deliberately severed, and this expedites and facilitates the operation. If it is very desirable to save the ducts, Ferguson says another expedient may be adopted which aids as a guide to save them. This is to open the inguinal region, and seeking out the vas deferens to pass a fine probe down to the sinus pocularis. The best material he has found for this is fine aluminum bronze wire doubled on itself. If catheterizing the ducts is impracticable, methylene blue can be injected, which will make it possible to recognize this tissue if it is injured. He makes it a practice to stain the bladder and prostatic urethra in all cases, and before operating to wash it out of the bladder, and in its place leave a solution of boric acid, sufficient to distend the bladder to its utmost capacity. As regards drainage he thinks the technique is improved and convalescence hastened by draining through the penis by an ordinary retention catheter, No. 23, American.

Fracture of the Fifth Metatarsal Bone by Inversion.—

COTTON, F. J. *Boston Medical and Surgical Journal*, vol. clv, No. 9, p. 229, Aug. 30, 1906.

The consequences of overlooking a fracture of the fifth metatarsal bone are usually not serious, as the deformity is slight and there is comparatively little pain or limitation of motion. The writer has seen six cases in the last three years, and the relative infrequence with which this condition is referred to in the literature shows that the most of them are grouped with sprains. The history of these cases is commonly significant. The patient has either through a sudden motion or in a misstep trodden on the outside of the foot. There is pain and some lameness, but the disability is never extreme and usually very moderate. The complaint is that the outer side of the foot is lame and that the patient cannot rise on the toe. On examination there is a little swelling, but with little or no ecchymosis on the outer edge of the foot. There is pain and tenderness about the



Tracings from *x*-ray plates showing the site of fractures.

base of the fifth metatarsal bone. Crepitus and mobility are not usually found. The diagnostic points are a maximum tenderness localized in front of the posterior end of the fifth metatarsal. There is pain on inward pressure at the distal end of the fifth metatarsal, the pain not being referred to the site of pressure but to the base of the metatarsal. Pain on upward pressure on the distal end of the metatarsal or on putting the weight on the foot is disproportionately slight. The causes which lead to the fracture are not definitely known, except that it results on inward pressure on the outer edge of the foot. The drawings illustrate the site of the fracture as traced from *x*-ray plates.

The Ulnar Nerve as a Landmark of the Elbow.—

COTTON, F. J. *Boston Medical and Surgical Journal,* vol. clv, No. 14, p. 376, Oct. 4, 1906.

Attention is called to the frequency of displacement about the elbow-joint and the difficulty of recognizing the various landmarks. The ulnar nerve lies in an anatomically constant position behind the internal condyle. It is bound down loosely by fibrous tissue, is a large nerve, and is not covered by muscle. It can readily be reached even in the presence of much swelling and identified, not only because it is the only cord-like structure at the back of the elbow that can be rolled under the finger, but the subjective sensations produced by pressure on the nerve can be recognized by the patient. Where the other landmarks are obscured and displaced, starting with the identification of the ulnar nerve the position of the various structures can often be identified. The objection may be made that the ulnar nerve may be displaced, but it is uncommon, occurs only when the arm is flexed, and only in cases in which the nerve is abnormally movable.

Three Ureters Demonstrated During Life, One of which was Infected.—

LEWIS, B. *Medical Record,* vol. lxx, No. 14, p. 521, Oct. 6, 1906.

The writer describes a case of persistent recurring gonorrheal infection of the urethra in which the usual methods of treatment utterly failed. Persistent efforts at disinfecting the lower urinary tract resulted in only temporary improvement, scarcely a month going by without lighting up the infection in the urethra. On examining the bladder with a cystoscope two openings were found on the left side of the bladder corresponding to two ureters. These were demonstrated to extend to the pelvis of the kidney by passing a lead sound into the ureteral catheters and then skiagraphing. One of the ureters was found to be infected with the gonococcus, and it was from the latter that the urethra was infected.

Cancer of the Rectum.—

KELSEY, C. B. *Medical Record,* vol. lxx, No. 14, p. 524, Oct. 6, 1906.

The writer believes that every suitable case of cancer of the rectum should be subjected to immediate excision or resection by some one of the half-dozen well-recognized varieties of the operation. Every other case should be treated at once by colostomy. He considers cases alone operable which admit of complete removal of the disease with no more risk than attends any other major surgical operation. The mortality-rate depends upon the selection of cases as well as the manner in which the operation is done, but like cancers everywhere in the intestinal tract the results are not very satisfactory. No one operation is applicable to all cases as the site of the growth must be the controlling factor. The greatest palliative for cancer of the rectum is colostomy.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

The Use of the Pessary.—

SLOCUM, H. A. *New York Medical Journal,* vol. lxxxiv, No. 9, p. 418, Sept. 1, 1906.

Quotations are made from English authors which show that the reaction against the use of pessaries has gone too far. As a matter of fact it is extensively resorted to in the treatment of gynecological cases. The favor in which the pessary is regarded is due to the fact that it has secured results in a large proportion of cases when it has been judiciously used. Davenport estimates the successful results at 50 per cent. The objections urged against the pessary have been due to faulty judgment in its use. Such opinions have been frequently expressed, and Fritsch declared that it was easier to perform a laparotomy than to apply a well-fitting pessary. If the results of treatment with the pessary were invariably bad it would soon lose its vogue

as a method of treatment, but that the results are sometimes good is proof of the value of the pessary when properly used. The same variation of opinion is found regarding operative methods. The judgment of men who operate largely is not reliable in relation to the pessary, as they lack the patience demanded by minor operative gynecology; also the cases that come to them have been screened through the hands of a number of general practitioners, hence they only obtain the more severe and resistant cases.

The Smith-Hodge pessary should be employed in uncomplicated cases, especially those of recent origin, such as occur after a fall or severe and undue muscular exertion. With it the uterus may sometimes be replaced and retained. At other times it is difficult to place the fundus where it belongs. The most common causes of failure are adhesions and peritoneal contractions. Sometimes atmospheric pressure in cases of relaxed rectums may carry the anterior rectal wall so far forward as to prevent the descent of the small intestines between the uterus and the rectum, the most important matter in replacing the uterus. An important indication for the use of pessaries is when the patient is in no condition for a radical operation, or when it is necessary by curettage and local treatment to lessen the size of the organ. Sometimes an anterior attachment to the abdominal wall of a heavy, congested uterus may result in stretching or tearing the adhesions and a recurrence of the displacement, when if a preliminary treatment with the pessary had been employed the operation would have been a success. A pessary is especially valuable after childbirth in cases that are predisposed to retroversion. The judicious use of a pessary in such cases often prevents a retroversion. Another and valuable indication often met by the pessary is in overcoming sterility.

The contraindications for its use are inflammations of the vagina, vulvar lesions, and acute cystitis. Among the more remote lesions is the possibility of cancer developing as a result of irritation by the pessary. When the vagina is lacerated or relaxed a pessary is useless, as it is in cases in which the vagina is conical, and those presenting senile changes with a friable, inelastic, and smooth mucous membrane. Laceration of the cervix, especially bilateral, precludes the use of a pessary. Opinions differ as to its value in retroflexion, but personally the writer is opposed to it as its action increases the lesion. The most serious results from the use of a pessary are in cases of retroversion with adhesions and those presenting tubal and ovarian complications. It is well to remember that retroversion without symptoms should not be treated.

The Relation of Weight to the Measurements of Children During the First Year of Life.—

FLEISCHNER, E. *Archives of Pediatrics,* 23d year, No. 10, p. 739, October, 1906.

Reference is made to the abundant observations on the height and weight of normal children. It has been recognized that the circumference of the head, chest, and abdomen bears some relation to the weight, and it has been crudely inferred that where the weight is below normal all the measurements are reduced. The writer has studied the weight and measurements of abnormal children and the relation they bear to normal children. He offers the following conclusions:

1. The height and circumference of head, chest, and abdomen in normal, well-nourished children increase with the weight, the greatest increase in the measurements occurring during the first quarter of the first year, when the greatest gain in the weight takes place; the next greatest increase in the measurements occurs, coincident with the gain in the weight,

during the second quarter of the year; while the least increase in the measurements takes place in that part of the year when the gain in the weight is least, the third quarter of the year.

2. The height and the circumference of the head and chest in fairly well-nourished children likewise increase primarily with the weight, although in this class of patients age plays more of a part than in the well nourished. The greatest increase in measurements occurs in the first quarter of the year, with a similar gain in the weight. The increase in the height, and circumference of the head, is slightly greater in the third quarter than in the second quarter, although the gain in weight during these periods is the same, showing the slight bearing that age, irrespective of weight, has on the growth of the body, while the smallest gain in the weight and the growth is in the last quarter of the year.

3. It is in the poorly nourished children that age plays its most important part, and the measurements of these children, compared with the well nourished, increase most rapidly in the last part of the year.

4. In the poorly nourished children, most of whom are probably somewhat premature, when the weight is below normal all the measurements are correspondingly below normal. The height and circumference of the head reach the normal birth measurements a little ahead of the weight, while the chest and abdomen are two months later in reaching the measurements of a normal child at birth.

5. When the weight is stationary the increase in the measurements is very small, depending upon the slight influence which age has upon the growth of the infant notwithstanding the weight.

6. The measurements of infants of the same weight, notwithstanding the age, are very similar, the small difference depending, as when the weight of a child is stationary, upon the very slight influence of age upon growth.

7. The final conclusion can be drawn that during the first year of life the primary factor in the increase of the measurements of the body is steady, consistent increase in the weight, the influence of age being secondary and much less important.

Tuberculosis in Infants and Children.—

GRAHAM, E. E. *Journal of the American Medical Association,* vol. xlvii, No. 19, p. 1555, Nov. 10, 1906.

Tuberculosis is common in children over four years of age, and in probably 90 per cent of the cases infection is through the respiratory tract, bacilli entering the lymphatic ducts and being arrested by the glands of the neck, trachea, and larger bronchi. It is important to recollect that tuberculosis of the lymph glands is very characteristic of the disease in early infancy, the disease being sometimes arrested permanently or for a time; in other cases going on to acute inflammation and caseation, and much depending on the resisting ability of the child. Tuberculous meningitis may occur, and in the first two years of life the principal seats of the disease are the lungs, bronchial glands, and brain. After the third year the mesenteric glands, peritoneum, and intestines are more likely to be involved than during infancy, but throughout the whole period of childhood the lungs are almost always involved in all moderately advanced cases. The most common type is a double tuberculous bronchopneumonia, more rapid in its course in infants than in older children. The clinical picture often presents many curious features, rendering diagnosis difficult or well-nigh impossible. Graham describes chronic, subacute, and acute forms, the former running a slow course and after the eighth year of life closely resembling the adult type. The subacute cases generally last from two to six months, and the lung symptoms may

be preceded by a gradual loss of weight for a month or six weeks, the cough being slight and spasmodic. Later the pulmonary symptoms are more noticeable. In the acute cases there are tuberculous deposits and miliary tubercles in the lung, and in addition a simple bronchial pneumonia. The symptoms closely resemble those of ordinary non-tuberculous broncho-pneumonia, but their rapid progression and the increasing weakness, and possibly a tuberculous meningitis, carry the child off.

When bronchopneumonia tends to persist beyond the usual period tuberculosis should be suspected. The situation of pneumonia may assist in the diagnosis. In simple broncho-pneumonia the inflammation is apt to be in the lower posterior part of the lung; in the tuberculous form it is more likely to be in the upper portion. Leucocytosis is usually absent in tuberculosis unless there is a mixed infection, and leucopenia is commonly present. If the diseases in which the number of white cells is diminished, such as malaria and typhoid, can be excluded, the diagnosis may be aided by this symptom. Chlorosis may closely simulate tuberculosis, but the finding of the bacilli and history of the case will confirm the diagnosis. Inoculation experiments with glandular substance may decide in chronic cases. The failure of young children to expectorate makes sputum examinations hard to get, but a rubber tube passed down the throat and examination of the mucous scrapings will overcome the difficulty.

Temperature Taking in the Groin in Children.—

PARKS, A. H. *Journal of the American Medical Association,* vol. xlvii, No. 13, p. 1010, Sept. 29, 1906.

The writer points out the advantages of taking the temperature of infants in the closed groin. The oral method is hardly practicable, and there are some dangers in the rectal method in the exposure and possibility of breakage of the instrument, as well as some other inconveniences and objections. He has made comparisons of temperatures taken by the different methods, rectal and inguinal, in 175 children, ranging between four months and five years in age, under identical conditions, and found that the average difference between the temperature of the closed inguinal fold and the rectum is 0.34° F. (0.18° C.), while the normal temperature in the former in the child is 98.5° F. The great facility of the inguinal method was very noticeable, as the natural close apposition of the thigh to the body retained the instrument in place, and the retention of the thermometer in the groin was accomplished without any crying or uneasiness on the part of the child. In extremely emaciated cases it may be better to use the internal method, but when it is possible to use the external method the groin possesses decided advantages over the axilla. The usual variation between the groin temperature and that of the rectum (1/3 of a degree) is so small as to be practically disregarded for clinical purposes, and the absence of many of the objectionable features of the rectal method and the ease and reliability of the groin method give the latter several points of advantage. These should recommend it not only in hospital, but more especially in home practice among children.

Slight Deafness in Children.—

YEARSLEY, M. *British Journal of Children's Diseases,* vol. iii, No. 9, p. 401, September, 1906.

Much has been written on the recognition and treatment of the more severe forms of ear diseases among children, but there are a large number of cases of slight deafness which are not recognized, or if discovered are allowed to go untreated. A practitioner may be so unmindful of the consequences as to advise the parents that the children will "grow out" of the ear affection. Statistics gathered from all parts of the world show a remarkable preva-

lence of defects of hearing in schoolchildren, and the figures from widely separated localities have a striking similarity. Many individuals have a defect of hearing so slight that they are scarcely aware of it. That the defects in hearing are associated with backward children is shown by the fact that by far the larger proportion of such defects are found in those children having the poorest school records. It is such cases that require recognition. At present mentally deficient children and those that are very deaf are specially provided for, but sufficient attention is not given to the cases of slight deafness. It often happens that the inaptitude of such children is put down to anything rather than its true cause. It is called mental incapacity, or worse still, inattention. The normal child properly fed and looked after should have an active mind and be keenly alive to the acquisition of all knowledge which interests it. Inattention or the want of proper interest in its surroundings when habitually exhibited always means one of two things, mental incapacity or deafness. The two conditions are easily distinguishable by parent or teacher. If there is slight deafness the child suffers great disadvantage in school, experiencing difficulty in following the teacher's explanations sufficiently to comprehend them, and he consequently soon becomes discouraged and loses interest. The prolonged fatigue and resulting strain increase the child's inaptness, which becomes more accentuated as the lessons become more advanced.

The Mortality from Convulsions and the "Rickets Group" of Affections in Infancy.—

DIVINE, T. *British Journal of Children's Diseases,* vol. iii, No. 10, p. 443, October, 1906.

In the rickets group belong convulsions, teething, rickets, laryngismus, and scurvy. Of 16,182 deaths reported in this group in England and Wales in 1903 there were 14 deaths from convulsions to each 1000 births, teething about 2, and the three remaining diseases a fraction of one per cent. The predisposing condition in these cases is more or less closely related to improper food, acting either as an irritant or by producing malnutrition. In a study of the death returns the writer comes to the conclusion that the relation between convulsions and rickets is very close, and that rickets as a cause of death is enormously understated. In the large majority of children who suffer from convulsions between the ages of six months and three years the signs of rickets are present. In the majority of instances where death is attributed to convulsions between the period of six years and three months the predisposing cause is rickets. This results in the mortality for rickets being so greatly understated. Of all the factors in the causation of rickets the most important is improper feeding, which culminates in malnutrition, not the simple errors in diet to which diarrhea may be attributed. It is probable that many who do not die enter the earlier periods of childhood seriously handicapped and contribute much to child mortality.

The Feces of Starch-fed Infants.—

LOPEZ, J. H. *Medical Record,* vol. lxx, No. 13, p. 495, September 29, 1906.

The writer tested the digestion of these infants, who were fed in five classes. The feedings were wheat gruel, arrowroot gruel, wheat and barley water, home-modified cow's milk, and highly saccharated food containing converted starch. Fifteen of the infants at the beginning of these observations had perfectly normal digestion, while ten had intestinal indigestion. The digestion of the infants in the first three classes was not impaired by this diet, while those who had not been well improved in health. Disturbances of digestion were noted in the last two classes. The writer is convinced from his work that young infants do healthfully digest starch.

FORENSIC MEDICINE AND TOXICOLOGY.

Liability for Negligence of Nurse in Sanitarium.—

Journal of the American Medical Association, vol. xlvii, No. 13, p. 1225, Oct, 13, 1906.

The Supreme Court of Louisiana (Stanley *vs.* Schumpert) discusses the relation of a nurse employed in a sanitarium. A physician suggested to the plaintiff (his patient) that during the treatment of his eyes he should stay at a certain sanitarium. The physician prescribed a mild collyrium to be applied under the direction of a trained nurse. The nurse instead of administering the mild solution put the dropper into alcohol, which was applied freely to the patient's eye. The injury if any was very slight, although the alcohol caused intense pain. An action for damages was brought. Two of the defendants were not connected with the management of the sanitarium at the date of the accident, so suit against them did not lie. A third defendant, who at the time was lessee of the sanitarium, and who was alone responsible for its management, the court held was liable for nominal damages, which was fixed in this case at $25 for the suffering which the negligent mistake occasioned. An attendant in the sanitarium, the court held, should be careful, and it is the duty of those in charge to compel the nurse to be careful and not to neglect the patient who is under the care of the sanitarium, which must see to some extent at least that medicines are properly administered. The nurse should exert her best endeavors to avoid mistakes of any kind. The functions of a nurse are sufficiently important to render her and her employers liable in damages for inflicting pain negligently. This nurse was employed by the sanitarium and had charge of the plaintiff's case in accordance with his contract of employment, she acting for the sanitarium under the direction of the plaintiff's physician. Her duty was to carry out the orders of this physician, and it was the duty of the sanitarium to see that she carried out the orders devolving on her as a nurse. The management of the sanitarium was liable because it had the right of control and of discharge.

Identification by Finger Prints.—

KEAN, J. R. *Journal of the American Medical Association,* vol. xlvii, No. 15, p. 1175, Oct. 13, 1906.

The writer describes the system of personal identification to be put in use in the United States army. He declares that some such system is a necessity in this country, not only for convenience of military administration to purge the army of criminals, repeaters, and other undesirable characters who have gained admittance through fraudulent enlistment, but also to protect the interests of the government and the individual in case of claims against the former based on the fact of military service. It may also assist to a certain extent in the identification of the dead. The system first adopted in the United States army (1889) was an adaptation of the pathologic division of the Bertillon system, viz., description of moles, scars, tattoos, blemishes, etc., together with certain simple measurements and physical characteristics, such as height, color of hair, eyes, and skin. The complete Bertillon system was not adopted because it required the use of bulky and expensive instruments for exact measurements, and considerable practice and skill in their manipulation. This system fulfilled very satisfactorily for our small army during a decade the special purpose for which it was introduced, namely, to check the custom of "repeating," by which is meant the fraudulent reënlistment, usually under an assumed name, of deserters and dishonorably discharged men. After the war with Spain this

system was found to be inadequate. Although its use was not extended to the volunteer troops the number of transcript cards on file was over 200,000. A board was appointed October 11, 1905, to investigate the various systems of personal identification now in use, and after an exhaustive study of the subject it recommended the adoption of the finger-print system, supplemented by a photograph and brief personal description. The reasons given by the board for preferring the finger-print system of Galten, as improved by Henry, to the anthropometric system of Bertillon are: (1) Its greater simplicity of operation. (2) The small cost of the apparatus required. (3) The fact that all the skilled work required is transferred to the central office, and so it is only there that experts are required. (4) Greater rapidity of operation. (5) Greater certainty of results. Kean gives in detail the methods of procedure and classification, and states that an expert in searching for a duplicate can find it in five or six minutes if it exists in a record of 100,000 cards. This system, he states, will be very valuable in obviating the necessity of much correspondence and collection of evidence at present required to prove identity in cases coming before the War Department and the Pension Bureau. After the introduction of this system any man who has served in the regular army can at once establish his identity by placing his right forefinger on the ink pad of an ordinary rubber stamp and making a finger print below his name. Unknown dead, brought from battle-fields into field hospitals, or who die there, can in this way give a record which will lead to their identification; and a copy of the finger print buried in a vial with the body will be a permanent and certain identification of it. It is expected that the new system will soon be put into operation. This article is fully illustrated.

Value of Physicians' Services.—

Journal of the American Medical Association, vol. xlvii, No. 13, p. 1053, September 29, 1906.

The Supreme Court of Colorado in Sills *vs.* Cochems discusses the criteria governing the value of medical services, though the sole question before it was to determine whether evidence tending to show that the plaintiff was busily engaged in the practice of his profession was admissible in an action brought by a physician to recover for professional services. When an attorney sues on a *quantum meruit* for professional services, his professional standing is a proper subject of inquiry as affecting the value of the services. The amount of his professional business may be inquired into as tending to show his professional standing. The court's attention was not directed to any cases where it was held that a different rule should obtain in determining the value of a physician's services. The same reasoning which prompts the doctrine as to attorneys seems to warrant its application to physicians. The value of professional services may depend considerably on the character and standing of him who performs them. In the first place there are diversities of gifts: the period of time passed in the profession, the experience, degree of skill, and faculty of using professional knowledge make great differences in individuals. The services of some are worth more than the services of others because they will command more. Should a question arise as to the value of services in an action brought by a physician to recover fees where the nature of the services performed makes the possession of certain qualifications an important element in the value of those services, evidence of professional standing is clearly admissible. The fact that the plaintiff was very busy tended to show his professional standing. If constant practice in the art of his profession renders a

practitioner more capable than he otherwise would be, the extent of such practice is a matter which may be properly inquired into for the purpose of determining the value of the services.

PUBLIC HEALTH.

The Prevention of Syphilis and Prostitution.—

CUMSTON, C. G. *Journal of the American Medical Association,* vol. xlvii, No. 17, p. 1372, Oct. 27, 1906.

The writer considers the extinction of syphilis not altogether a chimerical dream, but states that the idea is Utopian in the present state of society. One of the most important means at our disposal, he thinks, is hospitalization, and this should be special for this class of disorders, since the end to be attained is prophylaxis, and the first condition to fulfil with this end in view, when dealing with venereal disease, is isolation. This should include not only voluntary hospitalization of those who would not willingly transmit their disease, but also obligatory hospitalization of prostitutes. If, he says, we could sterilize prostitution as we sterilize our surgical instruments the gonococcus and the spirochæta pallida to a great extent would be removed from our list of pathogenic organisms. Cumston considers the woman as the most guilty party in the spread of syphilis and venereal disease, as in the male, he says, there is no homologous condition to that of prostitution in the female. Another excellent measure for the prevention of both venereal disease and prostitution is the proper education of the young of both sexes in sexual matters, and this should be given at the age at which, in each individual case, such instruction becomes necessary for the purpose of moral and physical prophylaxis. He believes that the public should be specially instructed as to the dangers of gonorrhea, from the consequences of which so many innocent women are sufferers.

The part played by alcohol in the spread of venereal disease is also noticed. The foci of propagation of venereal disease are not limited to houses of ill fame; among them he enumerates "the comic opera company, the private dining-room, the furnished lodgings, the apartment house on the 'easy virtue' style, the steamboat stateroom, the massage and manicure parlors, the automobile, the electric baths, the fortune-telling outfits, and lastly, the avowed *maisons de joie.*" The down-town office-building and the bachelor apartment houses are also included by him in this category. Lastly, Cumston mentions the false position of the law and of public opinion as to this matter, the condonation of sexual criminality in the male, and the comparative education above their class of working girls and the low salaries they receive, as well as the lowered conception of marriage, as factors to be counted in the problem.

Does the Bacterial Content of City Milk Influence the Infantile Death-rate?—

GOLER, G. W. *Archives of Pediatrics,* vol. xxiii, No. 9, p. 675, September, 1906.

The writer has carefully tabulated the deaths in the city of Rochester under five years of age in reference to the bacterial content of milk. He has found that the infantile death-rate bears a close relation to the average number of bacteria per cubic centimeter found in the municipal milk supply. During January, March, April, July, August, September, October, November, and December the lines showing the deaths and those showing the number of bacteria per cubic centimeter in milk either approximate or have to be overlaid in plotting the chart. He says that the relation shown between the bacterial content in milk and the

deaths in children under five years of age for five years may be but a coincidence, but it is at least a striking one, especially the very close relation that exists between these two sets of figures in the months of July, August, and September. In February, May, and June there is a wide variation between the infantile deaths and the bacterial content of Rochester milk. There is apparently no explanation for the February variation, but in May and June the cows are commonly out at pasture and the weather is wet, and they get more or less plastered with barn-yard fifth. During these months neither the producer nor the retailer has begun to properly cool the milk, which is frequently found at the stations with a temperature of from 60° to 70°. The figures certainly emphasize the importance of cleanliness in the stable and dairy, and for icing and sterilizing the cans and not the milk in handling a municipal milk supply.

The Type in School-books.—

WILLIAMSON, R. T. *Lancet,* vol. clxxi, No. 15 of vol. ii, p. 988, Oct. 13, 1906.

Whatever conclusion may be adopted as to the efficiency of eye-strain in causing myopia, there is no question but that it aggravates it. Cohn has carefully studied this subject, and believes that defective and too small type in school-books and college text-books are responsible for a good deal of eye-strain and consequent myopia. Cohn's conclusions are that the letter "n" in all school-books should be not less than 1.5 millimeters in height, and the least distance between two lines of type should be 2.5 millimeters, and the thickness of the stroke of the letters not less than 0.3 millimeter. The greatest length of the line should be about four inches, and the greatest number of the letters in one line should be 60. A simple test is to take a cardboard having an aperture of one square centimeter. The hole is placed on the printed page of the book, the lower edge of the square being immediately above one line of print. A satisfactory type should be so large that only two lines of print can be seen in the square. If more than two are seen the type is too small. The distance separating the lines is important, since a small type with the lines well separated is more easily read than larger type with the lines close together. Applying these tests to 250 school- and text-books the writer found that the type was too small in 111, or 44 per cent.

Dangers from Use of Lead Pipe in Water Systems.—

BALDWIN, H. C. *Boston Medical and Surgical Journal,* vol. clv, No. 18, p. 511, Nov. 1, 1906.

Two epidemics of lead poisoning are reported due to the introduction of a public water-supply, and which were not recognized by the attending physicians until the attention of the health authorities was called to them. The cases had been treated for colic, indigestion, and debility. The epidemics were caused by the use of lead service pipes which connected the houses with the mains. According to the report of the State Board of Health of Massachusetts three important towns used service pipes of lead, in twenty-three other cities and towns lead is chiefly used, while in 83 cities and towns no lead whatever is used. The dangers of lead piping are due to the amount of carbonic acid present in different water, and this varies often in the same water. The greatest number of lead cases occurred in four towns in which ground waters were used. Surface waters are also dangerous. It is recommended that the statutes in Massachusetts be so modified as to prohibit the use of lead piping in water installations.

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